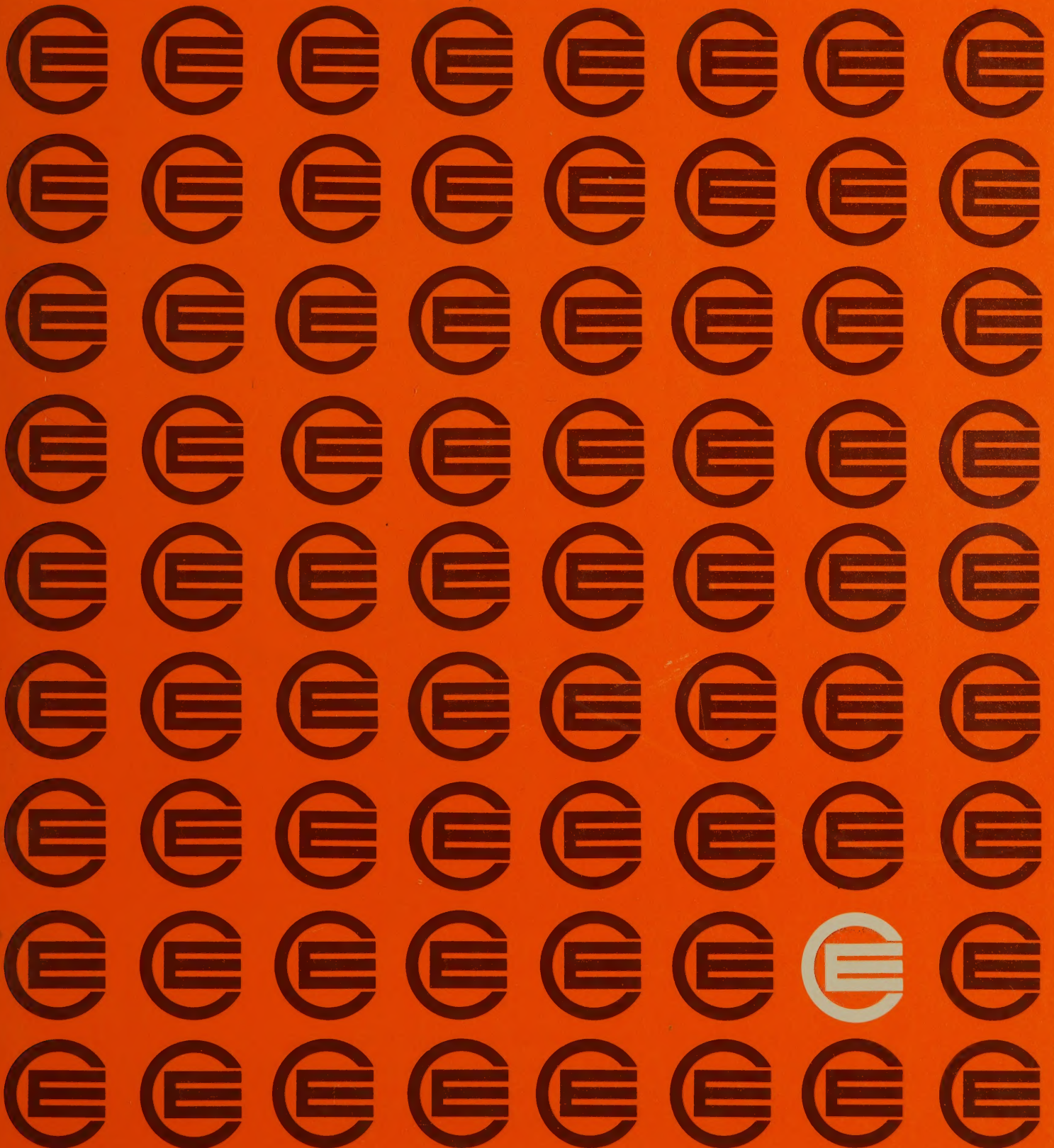


COLUMBIA

ELECTRONICS INTERNATIONAL, INC.

LOGISTICAL SUPPORT IN
ELECTRONICS FROM THE
MOST DIVERSIFIED
ONE-STOP SOURCE
IN THE WORLD!





Established 1946

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Printed in the United States of America.

COLUMBIA ELECTRONICS INTERNATIONAL, INC.

7360 ATOLL AVE., • P.O. Box 9266 • NORTH HOLLYWOOD, CALIF. 91609 • USA

Cable: COLECTRON • Phone: (213) 764-9030 • (213) 875-2970

Telex: 65-1460-COLECTRON



Columbia Electronics International, Inc.

2800 West Avenue, N. Walling Address Box 8500

Telephone: (213) 364-8000 • (213) 875-5500

Manufactured by Collins Radio - T96B

AM-4000A AM PRESSECTOR-AMPLIFIER

GENERAL DESCRIPTION

The AM-4000A is a portable, battery-operated, AM receiver. It is designed for use in the field, and is capable of receiving signals from a wide range of frequencies. The receiver is built around a single integrated circuit, and is housed in a rugged, weather-resistant case. It features a built-in speaker, and is capable of operating on a variety of power sources, including batteries and a car battery.

FEATURES

- Portable, battery-operated
- Rugged, weather-resistant case
- Built-in speaker
- Operates on a variety of power sources
- Wide frequency range
- High sensitivity
- Selective tuning
- Automatic volume control
- Tuning indicator
- Battery level indicator

TECHNICAL SPECIFICATIONS

Parameter	Value
Frequency Range	540 - 1700 kHz
Sensitivity	100 dBm
Selectivity	12 dB
Power Output	100 mW
Dimensions	4.5" x 3.5" x 1.5"
Weight	1.5 lbs

ORDERING INFORMATION

Part Number: AM-4000A
Price: \$199.95



Established 1946

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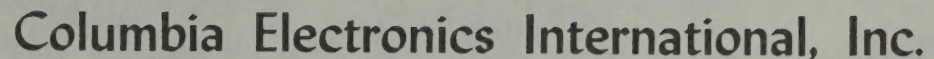
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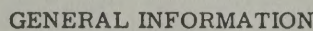
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Telex: 65-1460-COLECTRON



AM-4823/U RF PRESELECTOR-AMPLIFIER
Manufactured by Collins Radio - 1968



RF overload circuit . Protects internal components from damage. Operates at not less than 500 volts rms rf input ± 10 percent off frequency. Automatically resets when strong rf signal is removed.

Place
Stamp
Here

To: Columbia Electronics International, Inc.
7360 Atoll Avenue
P.O. Box 9266
North Hollywood, CA. 91609, U.S.A.

ATTENTION: DIRECTOR OF ADVERTISING

Notice

IMPORTANT! If you wish to receive future catalogs, new product bulletins and announcements of special sales please fill out this card completely. Mail it today! Please type or print clearly.

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☐ Test Equipment

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(Airline, Railway, etc.)

☐ Govt. Organization

☐ Ground Electronics

☐ Telephone

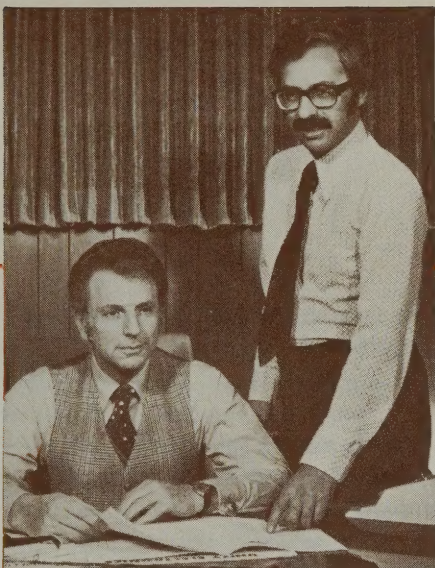
☐ Utility

☐ Household Radio or TV Repair

☐ Teletype

☐ Radio or TV Station

☐ Other: _____



Leonard B. Saken (seated)
President

Paul P. Keys
Vice-President

Dear Friend:

I am happy to provide you with our latest Columbia catalog which took us over two years to produce. Please keep it handy. It contains one of the widest, most detailed, most unique collections of military and commercial electronics ever assembled.

In addition to being larger, this catalog is different from any prior issue — because Columbia Electronics is different. In the past, you knew us as a major supplier of new, used and reconditioned U.S. Department of Defense excess equipment. But today, in addition to handling such excess, we also are authorized distributors for a group of America's foremost manufacturers of newly produced, current equipment. While we represent some of these firms only in certain geographical areas, we distribute for others around the world.

This change, to you, is most important. It now means you can make Columbia your one-stop, one-shop, one-order source for anything in military electronics — whether it's new, used, obsolete, surplus, current, modified, reconditioned, as old as the Battle of The Bulge, or as new as the latest launch from Cape Canaveral.

Columbia Electronics was founded in 1946. Since then, we have sold millions of dollars worth of electronic equipment to the most demanding buyers in the U.S. Government, as well as to firms and government agencies around the world. There has to be a reason. And the reason is simply this: A Columbia customer is a satisfied customer.

You have my personal assurance that we will do everything in our power to merit your continued confidence. We will never knowingly mislead or misinform you. We will never knowingly be undersold by any competitor anywhere, any time. We shall always strive in the future, as we have in the past, to supply you with the finest merchandise, in the shortest time, at the lowest price.

That is my person-to-person promise to you — and you can rely on it.

Yours very sincerely,

COLUMBIA ELECTRONICS INTERNATIONAL, INC.

Leonard B. Saken, President

IT'S GOOD BUSINESS TO DO BUSINESS

HOW TO GET THE MOST OUT OF THIS CATALOG

We would like to present here a few suggestions that will help you get maximum use out of this catalog, and in addition, make the business relationship between us smoother, simpler, and more efficient.

EXACTLY WHAT IS MEANT BY "SURPLUS"?

The word "surplus", as used in this catalog, designates two main types of electronics equipment:

1. It refers to materials which were declared surplus or excess to the needs of prominent American manufacturers such as RCA, Lockheed, General Electric, TRW, Litton Industries and others.
2. Surplus equipment also refers to excess U.S. Department of Defense property which was originally manufactured to the specifications of the U.S. Department of Defense. Some of this government surplus may be superior to their commercial counterpart.

PRICES

It will be noted that no prices are mentioned in this catalog. Kindly contact us for price data on any items in which you are interested. It will be furnished promptly.

UNLISTED ITEMS

Columbia handles and has access to many thousands more items than are listed in this catalog. Our inventory is in a constant state of refinement, enlargement and change. If the equipment you need is not shown here — tell us about it. And remember: the more specifications you give us, the more accurately we can meet your requirements.

CONDITIONS OF MERCHANDISE

The condition of respective items is not shown in this catalog. The reason for this is that we often have the same item available in a variety of conditions such as: new and in original factory packing, like new, renewed, reconditioned, recalibrated, used, etc. Naturally, the price of an item varies in accordance with its condition. In contacting us about an item, state condition desired.

COLUMBIA REPRESENTS

As noted in the opening pages of this catalog, Columbia Electronics now represents a variety of manufacturers such as Teledyne, RF Communications, Comco, Hickok and others. Attention is invited to the fact that we represent some of these manufacturers only in certain geographical areas. Please advise us if you require any electronic material of new or recent manufacture from these listed or any other U.S. manufacturers whose products we may be able to supply.

COLUMBIA PROCURES

If the item you want is very special, custom-built, obsolete or "hard to find" — Contact Columbia. We have trade agreements with suppliers and contacts around the world to help us procure special equipment. We will be glad to put this service at your disposal without cost or obligation.

COLUMBIA HAS BEEN APPOINTED

Our experience, financial dependability, and reputation are such that we have been appointed as the American Procurement and Purchasing Office for foreign firms and governments. If you wish to appoint us as your buying representatives in the U.S.A., please direct a letter to: Director of Procurement & Purchasing, Columbia Electronics International Inc., P.O. Box 9266, 7360 Atoll Ave., North Hollywood, Calif. 91609, USA.

WITH COLUMBIA ELECTRONICS

THE CHOICE IS YOURS

There are many cases when a buyer wants, and is willing to pay for, newly manufactured merchandise obtained from current production. In such cases, he will have shipped to him exactly what he ordered. In other cases, however, he has the choice of accepting — at a substantially lower price — a comparable piece of equipment which, while not of current manufacture, is still new and unused. Or, it may have been previously used — and reconditioned. In which case, the price is still lower. In instances where we suggest substituting a reconditioned or renewed item for a brand new one, please keep these facts in mind: 1) you will always save money by choosing the reconditioned item — sometimes, as much as 75% of the cost of a new item. 2) when we designate a piece of merchandise as being Reconditioned or Renewed, we warrant the reconditioning to be as new, in accordance with original factory or military specifications. 3) we also warrant it to look like and perform in the same condition as when it was new and, further, to fulfill the same specifications established by the manufacturer for new equipment. Whatever your choice, you always do best when you deal with Columbia.

ON SPECIFICATIONS

Because of the quantity of items covered in this catalog, we have restricted ourselves to the listing only of principal specifications. Please remember that complete specifications for all listed equipment are on file in our Technical Reference Department. We have on hand technical manuals, some going back to World War II, which contain descriptions prepared when the items in question were originally manufactured. Write us for complete data on any items in which you are interested.

WHERE THE SAVINGS ARE

Although we distribute equipment of current manufacture, a portion of our business involves the sale of excess, new, like new and reconditioned merchandise obtained from U.S. Government surplus. If you can use it, this surplus equipment — which may have been manufactured as recently as a few years ago, will be your best buy practically every time. And you take no chances when you buy surplus from Columbia. We warrant our merchandise to be in perfect working condition, and to meet all applicable specifications. If you wish our advice on whether a piece of surplus equipment may be substituted for a newly manufactured item — just ask for our PR (Product Referral) Service. Our PR Service has saved buyers around the world hundreds of thousands of dollars. We will be happy to make it available to you. Many buyers have found the design, construction, and reliability of U.S. Government surplus equipment to be equal or superior to newly manufactured merchandise.

USING THE INDEX

In order to help you find the items in which you are interested, we have printed an alphabetized index on the last page of this directory. If the item you want is not found under one heading look for it under an alternate heading. The aircraft receiver you want, for example, may be listed under AIRBORNE RADIO SETS.

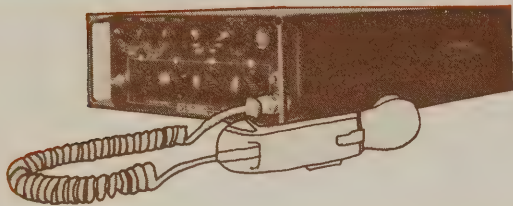
THIS CATALOG IS COMPLETE — AND INCOMPLETE

While this catalog gives an excellent cross-section of Columbia's merchandise, we regret to say it is not complete. It does not reflect our entire inventory or our purchases since it was published. Please write us directly about any item in which you are interested and which you do not find in these pages.

AVAILABILITIES & SPECIFICATIONS

We reserve the right, without notice, to change any specifications or discontinue any item found in this catalog.

COLUMBIA REPRESENTS
RF COMMUNICATIONS, INC.



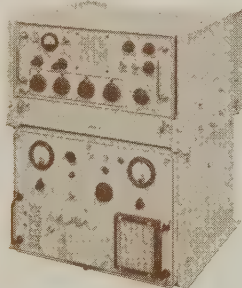
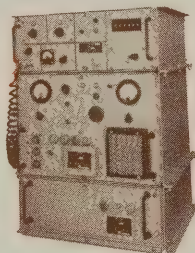
RF-301U UNIVERSAL TACTICAL 50W SSB TRANSCEIVER

The RF-301U Series is the latest development to provide total flexibility and adaptability to all military requirements, manpack, fixed and vehicular. This equipment utilizes a common transceiver and a wide variety of accessories for maximum flexibility.

Specifications: Frequency Ranges: 2 to 15 MHz in 1 kHz increments.
 • Operating Modes: USB, LSB, CW. • R-F output: 50 watts PEP; 20 watts CW. • Power Requirement: 12 VDC. • Available Configurations: RF-301UM vehicular, RF-301UB fixed base station, RF-301UP manpack. Write for complete specifications and quotations.

RF-130 1KW HF ISB SSB TRANSMITTER

A new generation of automatically tuned transmitters for fixed, transportable and shipboard applications. Complete coverage of the 2 — 29,999 MHz frequency, in 100 Hz increments. Available modes of operation include USB, LSB, Compatible AM, and 2 or 4 channel ISB. A wide variety of accessories and options are available, making this one of the most versatile transmitters on the market. Write for more information.

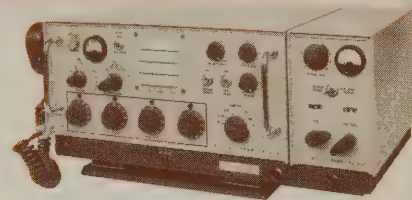
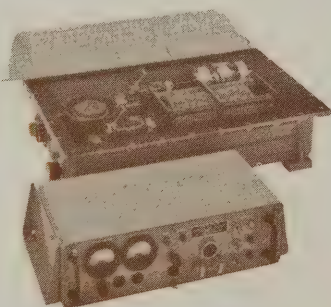


RF-121 1 KW SSB TRANSCEIVER

Features — 2 to 15 MHz — Synthesized — Rugged Construction — 1 KW PEP and Average — USB, LSB, AM, CW, RTTY — Flexible Power Input. The RF-121 is a rugged, high frequency, single sideband transceiver system designed for shipboard, fixed station or transportable shelter operation. Full power output of 1 KW PEP and average is provided in synthesized 1 kHz steps over the 2 to 15 MHz frequency range. Modes of operation include USB (Upper Sideband), LSB (Lower Sideband), AM (Compatible AM) and CW (Radiotelegraph). With the addition of the proper accessories, RTTY (Radioteletype) operation is also available. The RF-121 system is also available with other output power levels from 100 to 1000 watts on special order.

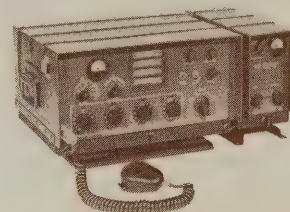
AN/URA-38 • RF-601 • 1 KW HF AUTOMATIC ANTENNA COUPLER GROUP

A 1 KW average power fully automatic remotely controlled antenna coupler for shipboard or fixed installation covering the frequency range of 2 - 30 MHz it will tune and load a whip antenna as short as 15 feet in 5 seconds.



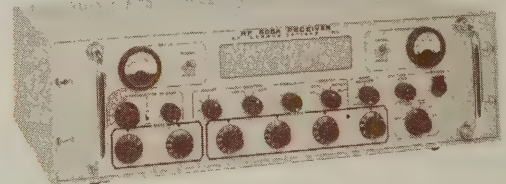
AN/URC-58 • RF-301 100W SSB TRANSCEIVER

A rugged 100W PEP or average power output transceiver covering the frequency range 2 to 15 MHz in 1 kHz increments, plus VFO for continuous coverage. Power input: 115/230 VAC 50-60 CPS, or 12 or 24 VDC. This set is widely used aboard all sizes of naval vessels. Its versatility is further increased by the wide variety of accessories and options which are available.



AN/GRC-165 • RF-301A 100W SSB TRANSCEIVER

Army version of the RF-301 (AN/URC-58). This set has the same general specifications as the AN/URC-58 except for its cabinet. Meets all requirements for a durable, tactical radio set for field, vehicular or fixed station use.



RF-505A SSB ISB RADIO RECEIVER

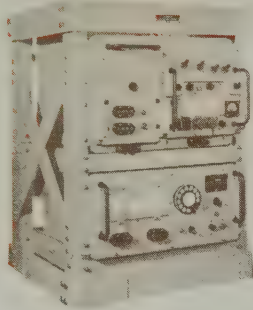
A dual conversion full coverage, fully synthesized professional receiver suitable for all types of service where performance and reliability are critical requirements.

Specifications: Frequency Range: VLF to 29,999 MHz in 100 Hz steps. • VFO continuous tuning also provided. • Modes of Operation: USB, LSB, AM, CW, ISB, RTTY, FAX. Write for complete data and quotation.



RF-507 PRESELECTOR AND PROTECTION UNIT

Features — Permits Full Duplex Operation — 1.5 to 30 MHz — Increases Receiver Sensitivity — Front End Burn-out Protection — Increases Receiver Selectivity. Critical HF communications applications often require both receiving and transmitting equipment to be operated simultaneously in very close proximity (e.g., ships and transportable shelters) at relatively close frequencies. However, such co-location usually results in a serious degradation in receiver performance due to the effects of blocking (desensitization), intermodulation and crossmodulation. Without the proper protection, such operation can, in many instances, even result in permanent damage to receiver "front-end" circuitry. The RF-507 Receiver Preselector and Protection Unit has been specifically designed to eliminate these problems while at the same time increasing overall receiver sensitivity and selectivity.

**AN/SRC-21A UHF RADIO SET**

Designed for shipboard to air UHF communications. The radio set operates in the 225 to 399.9 MHz range on any of 3500 channels, spaced 50 kHz apart.

Any of the 3500 channels selected is automatically tuned under the control of a memory and auto-tune circuitry.

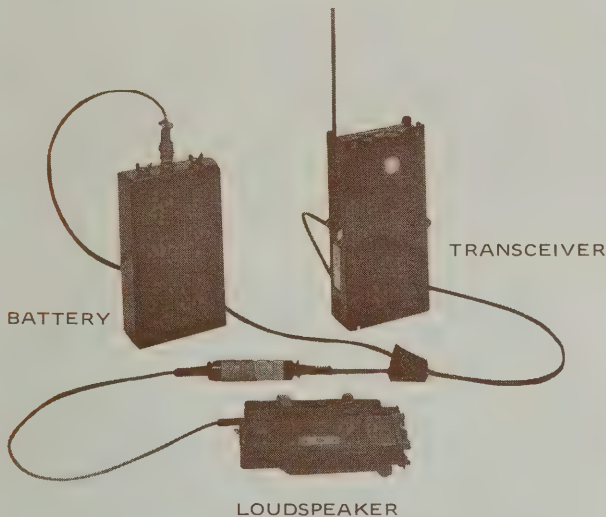
The set is capable of broadband operation. The broadband mode is selected by a switch function.

Major components of the AN/SRC-21A are the 16 watt transceiver AN/URC-9A and control unit C-3866/SRC.

May be operated from remote control locations by using a remote control unit.

Two AN/SRC-21A radio sets may be inter-connected to provide full duplex [two way] automatic retransmission capability.

Specifications: Frequency Range: 225.00 - 399.95 MHz. • Channels: 3500 spaced 50 kHz. • R-F Power Output: 16 Watts. • Fidelity: Narrow band ± 3 dB, 300 to 3500 Hz. Wideband -3/-6dB, 300 to 25,000 Hz. • Sensitivity: 3uv for S+N/N of 10dB. • Selectivity: 6dB, 800 kHz minimum, 60 dB, 150 kHz maximum. • Audio Output: 2 Watts, 600 ohm load. • Audio Fidelity: Narrow band $\pm 5/\pm 4$ dB, 300 to 3500 Hz, Wideband -3/-7dB, 300 to 25,000 Hz. • Squelch: Adjustable carrier or S+N/N squelch. • Size: 35-7/32" x 22-1/16" x 26-5/16". • Weight: 295 lbs.

**AN/PRC-75 UHF RADIO SET**

The AN/PRC-75 is a hand-held UHF transceiver that provides AM communications on any one of 3500 channels in the 225.00 to 399.95 MHz frequency range. Weighing only 3.9 pounds [excluding battery] this all solid-state radio produces an average output of one watt. All 3500 channels are readily available through the incorporation of a frequency synthesizer referenced to a single crystal standard oscillator.

Comprising the AN/PRC-75 are the UHF receiver-transmitter, a battery power supply, helmet speaker, lanyard, carrying harness, accessory cables and transit case. The antenna can be removed and an adapter connected for a coaxial cable to a separate or external power amplifier.

The R/T unit incorporates a push-to-talk button and transducer microphone as well as connector for battery and wideband operation.

Specifications: Frequency Range: 225.0 - 399.95 MHz. • Channels: 3500 spaced 50 kHz. • RF Power Output: 1 watt average. • Sensitivity: 2.6uv for 10dB S/N. • Size: 4-1/8" wide x 8" high x 1-1/2" • Weight: 3.9 lb. • Power Input: 24 VDC Battery, 5.9 watts receive, 17.6 watts transmit.

A mobile version of the AN/PRC-75 is also available. It includes a solid state 10 watt RF linear amplifier, mobile mounting and loudspeaker.

AN/SRC-20A UHF RADIO SET

Designed for shipboard to air UHF communications. The radio set operates in the 225 to 399.9 MHz range on any of 3500 channels spaced 50 kHz apart.

Any of the 3500 channels selected is automatically tuned under the control of a memory and auto-tune circuitry.

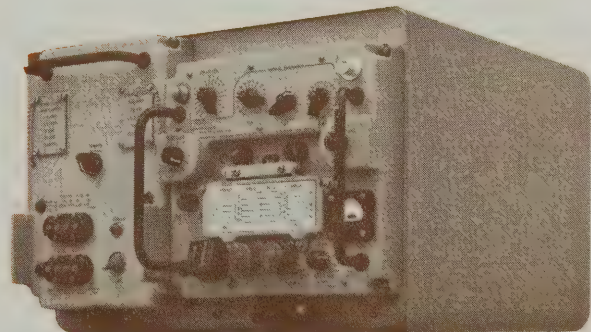
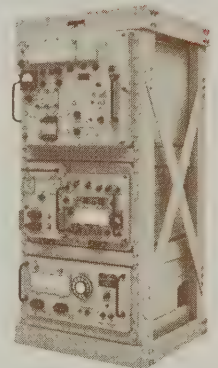
The set is capable of broadband operation. The broadband mode is selected by a switch function.

Major components of the AN/SRC-20A are the 16 watt transceiver AN/URC-9A, the 100 watt RF amplifier AM-1565/URC and control unit C-3866/SRC.

May be operated from remote control locations by using a control unit.

Two AN/SRC-20A radio sets may be inter-connected to provide full duplex [two way] automatic retransmission capability.

Specifications: Frequency Range: 225.00 - 399.95 MHz. • Channels: 3500 spaced 50 kHz. • R-F Power Output: 100 Watts. • Fidelity: Narrow band ± 3 dB, 300 to 3500 Hz. Wideband -3/-6dB, 300 to 25,000 Hz. • Sensitivity: 3uv for S+N/N of 10dB. • Audio Output - 2 watts, 600 ohm load. • Squelch - Adjustable carrier or S+N/N squelch. • Size - 52-23/32" x 22-1/16" x 26-31/32" • Weight - 529 lbs.

**AN/URC-9A UHF RADIO SET**

Designed for shipboard to air UHF communications.

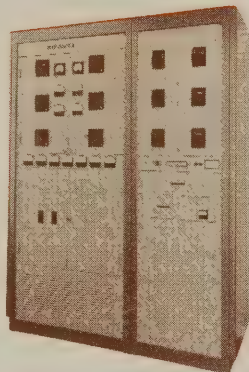
The set operates in the 225 to 399.9 MHz range on any of 3500 channels spaced 50 kHz apart. This set has a RF output of 16 watts. It is a major component of the AN/SRC-20A and AN/SRC-21A Radio Sets. It is ideal for smaller size vessels where space is at a premium. This set can be locally or remotely controlled, by one remote control station. Refer to AN/SRC-21A for detailed specifications.

COLUMBIA ELECTRONICS REPRESENTS TELEDYNE FOR A WIDE VARIETY OF MILITARY COMMUNICATIONS EQUIPMENT. WE SOLICIT YOUR INQUIRIES ON ANY TELEDYNE PRODUCTS LISTED IN THIS CATALOG.

AEROCOM 1330 ISB/SSB TRANSMITTER F.C.C. Type Accepted for Aeronautical Services

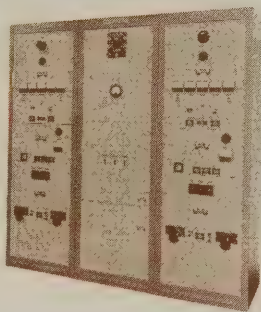
The AEROCOM 1330 is a six channel fixed station ISB/SSB or SSB transmitter designed for aeronautical, marine, point-to-point or other similar services. Provision is made for remote control of channel selection and press-to-talk functions.

Specifications: Frequency Range: 2 — 22 MHz • Emission: (1) ISB/SSB. Upper or lower sideband or both (A3A/A3B/A3J). (2) SSB only. Upper or lower sideband (A3A/A3J). (3) AME. Compatible AM - carrier plus one sideband (A3H) • Note: The AEROCOM 1330 is available for use on SSB mode or for use on ISB/SSB mode. Transmitters supplied for SSB mode only may be adapted to ISB/SSB at a later date by the addition of an SSB generator module. • The transmitter may be operated in either the suppressed carrier or reduced carrier mode. • Selection of AME and either SSB or ISB/SSB may be accomplished by remote control with the addition of proper control equipment. • When the transmitter is supplied with the ISB/SSB mode, the upper or lower sideband or the ISB mode may be selected remotely with the addition of proper control equipment. • Power Output: (1) 5000 watts continuous. (2) ISB/SSB — 5000 watts PEP. (3) AME-1250 watt carrier. • Channels: Six maximum • Freq. Stability: Crystals in ovens. ± 10 Hz max. Audio Input Impedance: (a) 600 ohms balanced. (b) 150 ohms unbalanced. • Environmental: -30°C to $+55^{\circ}\text{C}$, up to 95% humidity; up to 10,000 feet altitude. • Physical: Cabinet 58" wide, 28" deep and 77" high. • Weight: 1500 pounds. • Protection: Overload circuit breakers, fuses and door interlocks. • Input Power Requirements: 190 - 250 volts $\pm 10\%$ (3 wire), 330 — 420 volts $\pm 10\%$ (4 wire), 50/60 Hz, three phase, 12 KVA Max. • Tube Complement: Linear Amplifier — one external anode power amplifier tube. SSB Generator — All solid state. Converter/Driver — All solid state.

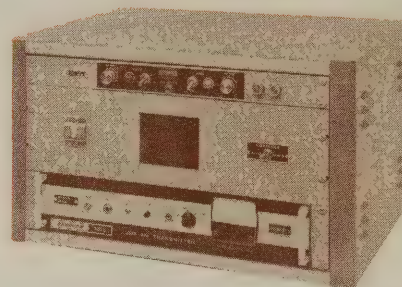
**MODEL 1000L AEROCOM 1000W NON-DIRECTIONAL RADIO BEACON**

A dual automatic beacon consisting of two transmitters and their associated control cabinet.

The Model 1000L is a single channel continuous duty AM radio transmitter designed especially for unattended operation in the Radio Beacon service. Its self-contained modulator provides for up to 100% modulation. Frequency Range: 200 - 525 Kc. • Output Power: The maximum nominal carrier power output (with any stable line voltage in the range 210-240 volts) is 1000 watts into a 75 ohm unbalanced resistive load.



WRITE FOR COMPLETE AEROCOM CATALOG. WE ARE DISTRIBUTORS FOR ALL AEROCOM PRODUCTS. YOUR INQUIRIES WILL RECEIVE PROMPT ATTENTION.

**AEROCOM MODEL 8080 ALL SOLID STATE VHF AM RECEIVER**

A single channel, crystal controlled, solid-state receiver featuring high performance, high reliability, compactness with accessibility. Designed for radio telephone service requiring low noise, high gain reception, it is a dual conversion super heterodyne employing intermediate frequencies of 21.4 MHz and 1750 kHz.

Specifications: Frequency Range: 118 — 136 MHz • Input Impedance: 50 ohms • Frequency Tolerance: $\pm .001\%$, 0°C to 50°C . (Crystal unit Type CR-83/U) • Sensitivity (For rated Output with a 10 dB s + N/N ratio with 30% modulation): 0.5 μV • Environmental: (a) Ambient temperature, 0°C to 50°C (b) Relative humidity, up to 95% (c) Altitude, up to 15,000 feet (4500 meters) • Design Features: (a) All components de-rated and selected for tropical service (b) Treated aluminum construction provides excellent high frequency bonding and prevents corrosion (c) All solid-state circuitry, utilizing IC's if practical. (d) Modular construction aids electrical isolation and facilitates maintenance (e) RF circuits employ "strip line" technique, assuring stability (f) Each module comprises basic printed circuit board construction, which contributes to uniformity of performance.

AEROCOM MODEL 7070 ALL SOLID STATE VHF AM 20 WATT TRANSMITTER

A single channel, solid-state transmitter featuring high reliability, high performance, compactness with accessibility, self-contained press-to-talk antenna transfer relay for an associated receiver (such as the AEROCOM 8080), and meter indications including Modulation Percentage and RF Power Output.

Specifications: Frequency Range: 118 to 136 MHz • RF Power Output: 20 watts, minimum • Spurious Emissions: More than 60 dB below transmitter output level • Overall Audio Response: 300 to 3000 Hz, within 3 dB • Primary Input Power: (a) 100 to 125 volts or 200 to 250 volts 47/63 Hz. 210 VA (max.) (b) Optionally, when specified on order, 24 to 28 VDC, 190 watts (max.) • Physical: (a) 19" x 3 1/2" x 14" deep for mounting in standard rack (b) Front panel is large etched plate, dull black on satin aluminum finish • Design Features: (a) All components conservatively rated and selected for tropical service (b) Treated aluminum construction provides excellent high frequency bonding and prevents corrosion. (c) All solid-state circuitry utilizes integrated circuits where practical (d) Internal fan employed for cooling (e) Transmit/Receive antenna change-over relay is built into equipment

NOTE: Illustration shows Model 8080 Receiver installed in optional cabinet with loud speaker, and Model 7070 companion Transmitter. UHF versions also available. Write for data.

ACCESSORIES AND SPARE PARTS

We can supply replacement parts, spares and accessories for all types of military electronic equipment. Tell us your needs.

COLUMBIA REPRESENTS SWAN



SWAN MODEL 310 300 WATT SSB TRANSCEIVER

300 W, PEP. Single or multi-channel, 2 to 30 MHz.

Specifications: Contains a single R.F. section combined with a power supply, audio section, and loudspeaker. In its basic form it operates on one frequency channel, and does not include a channel selector or sideband selector or sideband selector switch. This model is the simplest most reliable, and least expensive single sideband transceiver available anywhere. It is ideal for applications where only one channel is required.

An optional Channel Selector can be installed providing up to four closely spaced channels. Note that the maximum spacing permitted between the highest and lowest channel is three percent.

The optional Sideband Selector control can also be installed. By using both upper and lower sidebands you effectively double the number of channels.

Specifications: Power rating: 300 watts P.E.P. input.

• Frequency range: 2 to 30 MHz • Operates on either 117 or 230 volts AC, 50-60 cycles, or 12 volts DC (optional). • Dimensions are 9 in. wide, 7 3/4 in. high, 14 in. deep • Weight: 25 pounds.



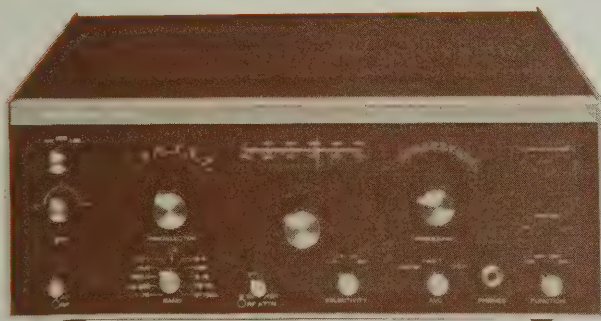
SWAN MODEL 400H 300 WATT SSB RADIO TRANSCEIVERS

A high powered Transceiver designed for voice communication in either fixed station, portable, or mobile applications. Up to 12 channels are available in 5 pre-tuned frequency ranges from 2 to 24 megahertz. With the Sideband Selector feature, which is standard, the number of channels is effectively doubled to 24. Applications include military communications systems, Civil Defense, as well as Business Radio and Marine Radio in many countries. The power rating of 300 watts peak-envelope-power output assures reliable, high quality communications over short, medium, or long distances.

MODEL 320 300 WATT SSB TRANSCEIVER

Similar in appearance to the Model 310, but provides up to 8 channels in two groups of 4 channels each. This set has the operational capability of 2 Model 310's in a single cabinet.

COLUMBIA REPRESENTS HY-GAIN



HY-GAIN GALAXY R-1530 COMMUNICATIONS RECEIVER

A new dimension in 0.1 - 30 MHz general coverage receivers. All solid state circuitry and modular construction place the R-1530 in a category of excellence unmatched by other units. Contains several outstanding features that were previously available only on military receivers costing three times as much.

A unique fiducial design provides calibrations and frequency correction every 50 kHz throughout the entire frequency range of the R-1530. A highly effective built-in noise blanker permits reduction of interference while a variable attenuator at the antenna terminal allows positive control over cross modulation.

Outstanding Features: Variable BFO for preuse adjustment during CW and RTTY operation. Permeability tuned preselector for maximum cross modulation reduction and minimum gain variation. Extremely stable permeability tuned oscillator for outstanding linearity and frequency resetability. Switchable crystal filters for instant selectivity selection. Phase lock oscillator, a unique advancement in design and frequency determination, gives the R-1530 its professional grade frequency stability.

Specifications: Receiver Type: RF Superheterodyne, dual conversion, solid state. • Frequency Range: 0.1 to 30 MHz continuous. • Frequency Readout: 1 kHz over entire 500 kHz tuning range of PTO. • Frequency Stability: From turn-on better than 100 Hz, including 20% line voltage variation. • Calibration Accuracy: 1 kHz with 50 kHz calibrator. •

Sensitivity: with 2.1 kc/s filter for 10 db SN/N

Frequency:	Without Preselector	With Preselector
0.05 MHz	5 uV	1.5
0.1 MHz	3.2 uV	0.5
0.5 MHz	1.6 uV	0.25
1 MHz	1.7 uV	0.25
2 MHz	1.7 uV	0.25
4 MHz	1.7 uV	0.25
10 MHz	1.7 uV	0.25
20 MHz	1.7 uV	0.25
30 MHz	1.7 uV	0.25
16 MHz	0.6 uV CW	0.1 uV CW
	1.2 uV SSB	0.2 uV SSB
	2 uV AM	1.5 uV AM

Selectivity: 2.1 kHz crystal lattice filter, 1.8:1 shape factor, SSB. Optional filters for CW (0.5 kHz) and AM (6.0 kHz) are available and all are front panel selected.

Functional Service: AM, CW, SSB (Selectable USB & LSB) and RTTY. Variable BFO utilized in CW mode tunable plus or minus 1 kHz.

Calibrator: 50 kHz

Power Requirements: 115/230 VAC, 50-60 Hz at 24 watts or 18 VDC maximum source drain 600 ma.

Size: 6" H x 17" W x 14" D Cabinet; Rack panel 8-3/4" H x 19" W x 14" D.

Weight: 25 lbs.

COLUMBIA CAN SUPPLY ALL OF HY-GAIN PRODUCTS. TELL US YOUR NEEDS.



DRAKE MODEL TR-44C TRANSCEIVER

Features: Receiver frequency coverage 1.5 to 30 MHz (except 5.0 to 6.0 MHz), Transmit frequency coverage 1.8 to 30.0 MHz (except 5.0 to 6.0 MHz), Transceiver or independent operation, AM, SSB, CW, RTTY, 1 kHz dial accuracy, 10 tunable 500 kHz ranges, 10 crystal-controlled channels, Noise blanker and 25 kHz calibrator, Four receive bandwidths, 120 watts output. Brief Description: The TR-44C consists of an R-4C Receiver and T-4C Transmitter in the same cabinet with built-in speaker. Unmatched versatility is achieved in a unit occupying less than a cubic foot of space.



The 120 watt output AM-SSB-CW station has up to ten crystal-controlled channels and ten 500 kHz tunable ranges with 1 kHz dial accuracy.

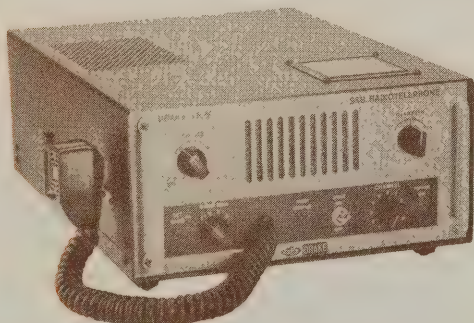
The TR-44C is comprised of receiver and transmitter sections which can be used independently on separate frequencies, or operated full transceiver, either crystal or VFO controlled.

The receiver section can be operated between 1.5 and 30.0 MHz except for 5.0 to 6.0 MHz. The transmitter section operates from 3.0 to 30.0 MHz except for 5.0 to 6.0 MHz, and in the range of 11.0 to 11.5 MHz the frequency must be crystal-controlled. In addition, either 1.8 to 2.3 or 2.0 to 3.0 MHz can be included.

Crystals for specific 500 kHz ranges and for fixed-frequency operation can be ordered.

Three power supply units are available to power the TR-44C. Model AC-4 which operates from 120-240 V, 50/60 Hz source and Model DC-4 which operates from 12 V DC and the DC-24 which operates from 24 V DC. These supplies are designed to operate the transceiver on any mode continuous duty.

Model TR-44C Transceiver is housed in a perforated metal cabinet 11½" H x 10¾" W x 12¼" D. Unit less power supply weighs 30 lbs. Write for complete specifications.



DRAKE TR-M 150 W. MARINE SSB TRANSCEIVER

Features: Low Cost, Simple to operate, built in power supply, built in antenna coupler, environmental protection, 11 programable channels, all solid state except for final output tubes.

Specifications: Frequency Range: 2 to 2.9, 3.75 to 5, and 6 to 9 MHz. Channels: Eleven (semi-duplex or simplex) programable on any band. • Input Voltage: 12.9 or 35 Volts DC $\pm$ 15% Models available. • Operating Modes: A3A, A3J, A3H. • Temperature Range: -30°C to 50°C. • Weight: 22 pounds. • Size 5-3/8" H x 12" W x 15-1/2" D. • Receiver: Sensitivity: 0.5 microvolts produces 1 watt audio and 10 dB S + N/N ratio. • Transmitter: Power Output: A3A, A3J — 150 Watts PEP USB. A3H — 150 Watts PEP, Carrier 3-6 dB down. • Frequency Stability: $\pm$ 20 Hz maximum drift. • Antenna Coupler: Built-in coupler that will match marine antennas normally used including 23 ft. whips above 4 MHz, 35 ft. whips and long wire antennas up to 75 ft. long, as well as 50 Ohm antennas. • Microphone: Ruggedized Hand-Held Carbon, high impact case.



DRAKE MODEL DSR-2 COMMUNICATIONS RECEIVER

Features: Continuous coverage 10 kHz to 30 MHz, Digital synthesizer frequency control, Frequency displayed to 100 Hz, All solid-state, AM, SSB, CW, RTTY, ISB, Series balanced gate noise blanker, Rack Mount Option Available, Accessories available to accommodate specific requirements.

The R.L. Drake model DSR-2 receiver is a commercial grade communications receiver employing the most up to date solid-state devices and circuitry offering continuous coverage from 10 kHz to 30 MHz. The received frequency is indicated by six NIXIE tubes to 100 Hz. All frequency injections of the DSR-2 are controlled by a phase locked digital synthesizer which allows incremental frequency selection in 10, 1, and 0.1 MHz steps. The remaining 0 to 0.1 MHz is continuously adjustable by a highly stable variable oscillator from the fine tuning knob on the front panel. The front panel controls allow the operator to select frequency, AM or SSB product detector, I.F. bandwidth, AF gain, BFO pitch, fast or slow AVC, manual RF gain and the highly effective Drake series gate noise blanker. ISB (Independent Sideband) is a built-in feature of the DSR-2. Separate I.F. crystal filter, I.F. amplifier, and audio output circuits allow two simultaneous communication channels to be employed on one frequency assignment. The R. L. Drake DSR-2 receiver is among the lowest cost commercial grade digital synthesized receivers available today.

Specifications: Frequency Range: 10 kHz to 30.0 MHz • Modes of Operation: USB, LSB, CW RTTY, AM, ISB. • Frequency Readout: Complete to 100 Hz on six NIXIE tubes. • Frequency Selection: 10 MHz, 1 MHz, 0.1 MHz switch selected. 0 to 0.1 MHz continuously variable. • Frequency Stability: Frequency drift does not exceed 200 Hz in any 8 hour period at constant ambient temperature between 0° to 40°C and constant line voltage after 1 hour warm up. • BFO: Derived from 5 MHz standard oscillator or variable over a $\pm$ 3 kHz range from front panel. • Sensitivity 0.01 - 0.5 MHz: Less than 4 microvolt for 10 dB SINAD at 2.4 kHz SSB mode. Less than 25 microvolt for 10 dB SINAD at 6 kHz AM mode with 30% modulation. • 0.5 - 30 MHz: Less than 0.3 microvolt for 10 dB SINAD at 2.4 kHz SSB mode. Less than 2.0 microvolt for 10 dB SINAD at 6 kHz AM mode with 30% modulation. • Antenna Input Impedance: 10 kHz to 500 kHz — 1000 ohms, 500 kHz to 30 MHz — 50 ohms • Audio Output: 2 watts at 5% maximum distortion into 4 ohm load. 4 ohm unbalanced and two 600 ohm balanced outputs. ISB output is one of the two 600 ohm balanced outputs. • Audio Hum and Noise: Greater than 60 dB below rated output. Power Requirements: 115/230 volts $\pm$ 10% single phase 50-420 Hz 15 watts. • Dimensions: 5.25 in H x 19 in. W x 15 in. D. • Weight: 17 lbs.

COLUMBIA CAN SUPPLY ALL R.L. DRAKE PRODUCTS. TELL US YOUR NEEDS.

THE PEN AND THE SWORD

The pen is mightier than the sword, and the typewriter is mightier than the pen.

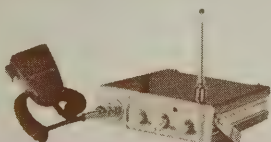
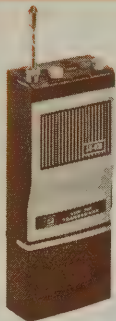
Columbia speaks your language. Send us an inquiry for any items in which you are interested. It will be answered quickly, courteously and remember — the more specific information you give us, the more accurately we can meet your requirements.

SCIENTIFIC RADIO SYSTEMS, INC.

**SR-400 & SR-450 HAND-HELD VHF FM TRANSCEIVERS**

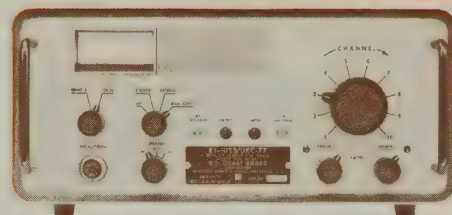
Scientific Radio Systems offers these reliable solid state transceivers designed for the most rugged applications. All circuitry is housed in 14 plug-in modules. Ideal for police, military, and private communication systems. A wide variety of accessories and options are available.

Specifications: Frequency Range: SR-400 132-174 MHz, SR-450 30 - 50 MHz. • Number of Channels: Up to 5. • R-F Output: Up to 4 watts. • Battery Life: 10 Hrs with NI-Cad. • Weight: 30 oz. (850 grams). • Write for complete data and price list.

**SR-475 MOBILE/PORTABLE VHF FM TRANSCEIVER**

A solid state, 25 watt mobile unit which can be removed quickly from its mounting bracket in a vehicle, and carried as a 7-pound portable with 8 watts output. Plug-in modules make servicing quick and easy. Comes complete with a built-in retractable whip antenna, microphone, speaker for portable use and mobile operation. Comes with mobile slide mounting bracket with built-in battery charger, mobile speaker and mobile antenna.

Specifications: Frequency Range: 132-174 MHz. • Number of Channels: Up to 5. • RF Output: 27 watts mobile, 8 watts portable. • Battery Life (Portable): 8 Hours with internal NI-CAD Battery. • Write for complete data and price lists.

**SR-210 • AN/PRC-77 150W HF SSB TRANSCEIVER**

A highly reliable, SSB transceiver ideally suited for base station, mobile or marine use. A military version known as the AN/URC-77 is currently being used by the U.S. Coast Guard for shore as well as shipboard use. A wide variety of options make this equipment suitable for almost any type of installation.

Specifications: Frequency Range: 1.6 - 30 MHz. • Channels: Up to 10. • Power Output: 150 watt PEP, 100 watts average. • Built-in Teletype and Terminal Voice Scrambler optional. • Write for complete data and price list for all options and systems designed to your requirements.

SR-120 1 KW HF SSB TRANSCEIVER

A very versatile highly reliable 1 KW SSB transceiver available with a wide variety of options making it suitable for point-to-point radio systems of all types. Radio teletype option also available.

Specifications: Frequency Range 1.6 - 30 MHz. • Channels: Up to 10. • Power Output: 1000 watts PEP or 500 watts average. (1000 watts average optional!). Write for complete data and quotations for systems designed to your requirements.



COLUMBIA REPRESENTS

COMCO**COMCO****VHF-AM AERONAUTICAL GROUND STATION**

For Control Towers, Airways, and Airline Operations. Model 678A: 10 Watt Transmitter, 25 or 50 kHz channel Spacing Receiver. Moderate initial cost for high performance equipment, economical to maintain.

VHF-AM VEHICULAR RADIO

Model 678A: 10 Watts output; 12, 6/12, 24 Volt DC input; also portable model in hand carried case, requires external 6, 12, or 117 Volt AC.

VHF-AM VEHICULAR RADIO

Model 730: 5 Watts output. An outstanding, performance proven value. Completely solid-state. 118-136 MHz. Size only 2-1/2" h x 8" w x 12" d. One, two, or three channel model available.

VHF-AM GROUND STATION

Model 731. Same as above except equipped with external supply for operation on 117 VAC. Ideal for UNICOM operation, or as a "Gate Radio" for airline operation.

VHF-AM PORTABLE PORTACOM

Model 732. Aviation's most versatile ground control radio — portable, mobile, ground station. 5 Watts output. 118-136 MHz. Compact, easy-to-carry package, only 2-1/2" w x 10-3/4" h x 15"D. With rechargeable nickel cadmium battery.

JETCOM — COMBINATION VHF-AM/FM MOBILE RADIO

For airport vehicles requiring communication with control tower and police or airline company FM frequency. Model 734/738 AM range — 118-132 MHz, FM range — 144-174 MHz, or 450-512 MHz.

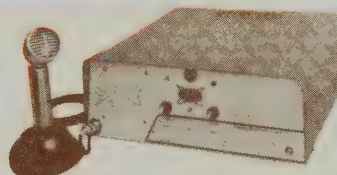
VHF-AM GROUND STATION

118-136 MHz. Model 778/779: Completely solid-state; transmitter output 10 Watts (no tubes); for installations requiring maximum reliability. 12 or 24 Volt DC power supply optional. Add-on Model 780 power amplifier increases 778/779 RF output to 50 Watts.

UHF-AM PORTABLE/MOBILE TRANSISTORIZED TRANSCEIVER FAA type TRU-2 (AN/URC-54). Model 703: Three-channel operation in 225-400 MHz range, military type construction.

UHF-AM 15 WATT GROUND STATION

For operation in the 225-400 MHz range. Model 725: Rack mounted construction; with provisions for remote control operation.



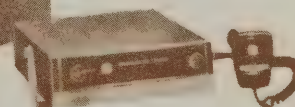
MODEL 678A



MODEL 731



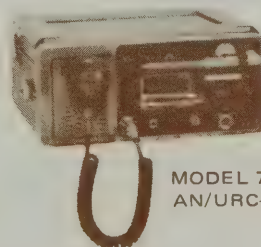
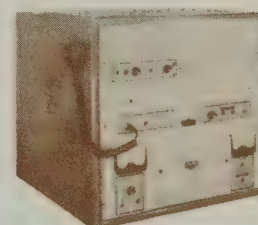
MODEL 732



MODEL 730



MODELS 734/738

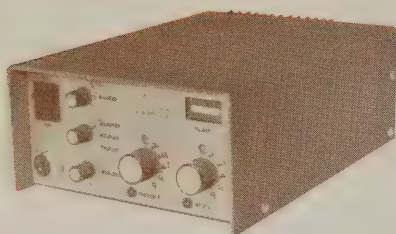
MODEL 703
AN/URC-54

MODELS 778/779/780

COLUMBIA REPRESENTS

CARVILL

CARVILL



CARVILL MODEL 304B VHF 50 WATT FM BASE STATION

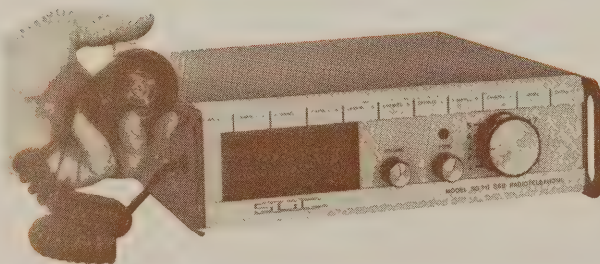
This versatile, economical transceiver provides up to 12 channel capacity.

Specifications: Frequency Range: 132-152 MHz or 150-174 MHz.
 • Number of Channels: 1 to 12 • Channel Spacing: 25 kHz
 • Power Source: 115/230 VAC 50-60 Hz or 13, 6 volts DC, negative ground. • Power Drain: 0.1 amp receive — 10 amp transmit. • Overall Size: Transmitter-Receiver: 8" x 12½" x 4" AC Power Supply: 8" x 12½" x 4" • Weight: Transmitter-Receiver: 10 lbs. AC Power Supply: 10 lbs. • Mode of Operation: Simplex, push to talk, Half Duplex, Full Duplex, Point to Point (continuous duty), Repeater (automatic carrier operated), Repeater (continuous duty)
 • Circuit Type: All solid-state for continuous 100% duty cycle. Final transistor amplifier protection for open or short circuit at antenna terminals. • Transmitter: RF Power Output: 50 watt
 • Frequency Stability: $\pm .0005\%$ - 30° to +60°C • Mobile version also available. Contact Columbia for all products manufactured by Carvill.

COLUMBIA REPRESENTS

SGC, INC.

SGC



MODEL SG 711 100 W SOLID STATE SSB RADIOTELEPHONE

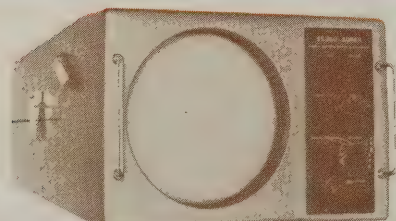
High Power Output — A full 100 watts PEP of single sideband "talk power" is delivered by the SG-711 on all modes. That means power output, not input! It can supply up to 50 watts of carrier output power for AM operation.

Specifications: Frequency Range: 1.6 to 9.0 MHz • Channels: Eleven simplex or split-frequency • Input Voltage: 13.6 vdc (24 or 32 vdc and 115/230 vac optional) • Circuitry: All solid-state, single

conversion superheterodyne, (10.7 MHz if), silicon integrated circuits and transistors • Operating Modes: A3J, USB suppressed carrier (LSB or USB/LSB optional) A3H, AM equivalent, A3A, reduced carrier (-16 db) • Weight: 14 lbs., 18 lbs. shipping • Size: 3.5" high, 12" width and depth • Receiver: Sensitivity: 0.5 microvolts produces 1 watt of audio with a signal to noise ratio of better than 20 db • Selectivity: 2.1 kHz at -6 db, 4.0 kHz at -60 db (2:1 shape factor)
 • AM Reception: Reinserted carrier or envelope detector (optional)
 • Audio Output: 5 watts with less than 10% distortion • Transmitter: Power Output: Nominal 100 watts PEP output on all modes 25-50 watts carrier output on A3H • Performance: Meets all FCC requirements • Stability: ± 20 Hz • Microphone: Ruggedized hand held carbon, high impact case • APC: Automatic Performance Control, optimizes voice level, prevents overmodulation and protects transmitter from damage • Export Models — are available for not only overseas marine applications, but for use in nets, cooperatives, public safety, civil defense and marine applications. This equipment features ultra low battery consumption. Mobile and base station antennas, plus a variety of power sources permit complete systems flexibility • Supplied with built-in antenna coupler. Unit is designed for long life and ease of maintenance. Write for complete specifications. Columbia supplies all products manufactured by SGC, Inc.

COLUMBIA REPRESENTS

WESMAR



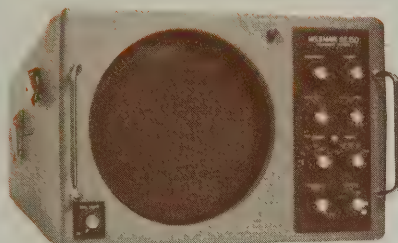
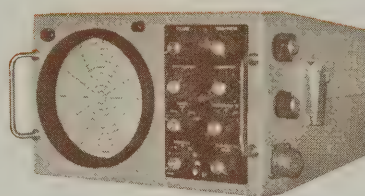
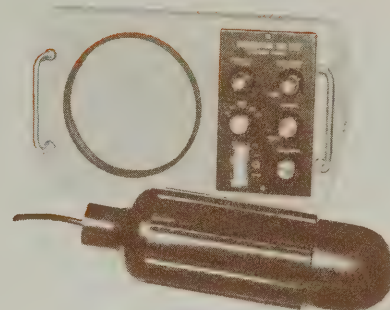
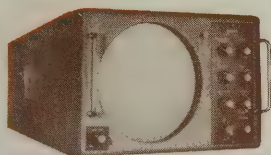
WESMAR MODEL SS300 SUBMARINE TRACKING SYSTEM

Communication between a mothership and her submersible sub is vital. Even more important to a successful underwater operation is the mothership's capability to pinpoint the submersible's range and location at all times.

The mishap of the research submarine, PISCES III, on the ocean bottom 150 miles southwest of Cork Island, Ireland in 1973 was kept from being a disaster by a Wesmar sonar. Time required for location of a downed sub can mean life or death to the crew. With the Wesmar tracking system, time lost in locating the sub is eliminated.

How Does the Wesmar SS300 Operate?

The Wesmar SS300 consists of a Wesmar SS300 scanning sonar with dual frequencies of 178 kHz and 39 kHz and a Vickers Oceanic transponder. The SS300 is designed, engineered, and fully tested at high and low temperatures, under shock and vibration in three axes. The Wesmar system fitted to a mothership knows the exact location of the submersible by transmitting a signal on a low frequency. This frequency is in turn received at the same frequency by a transponder on a sister ship. A signal is then transmitted back by the transponder at a higher frequency and is received by the mothership.

SS150 Horizontal
Scanning SonarSS130 Horizontal
Scanning SonarSS110 Horizontal
Scanning SonarCG300 Horizontal
Scanning SonarSS200B Horizontal
Scanning Sonar

WESMAR HORIZONTAL SCANNING SONARS

The Wesmar horizontal scanning sonar, designed and manufactured by Western Marine Electronics, are solid-state, high resolution devices made with materials that have been carefully selected to prevent corrosion and for suitability to marine environment. Designed for research, general navigation (advance depth sounder), seining, pipelaying and yachting, the Wesmar sonars are the latest advancement in marine electronics. With a Wesmar sonar a true range and bearing can be seen instantly at one time on a cathode ray tube display. As a gimballed transducer is rotated and tilted, the desired area can be scanned with sound waves in the water around the vessel. Its patented stabilization system compensates for the pitch and roll motions of the boat up to +25 degrees. Constant monitoring is not necessary as a distinct audible signal is heard when a target is encountered and an anti-clutter control filters out all "unwanted sea noise." The complete system includes a console, soundome, junction box and hoist unit.

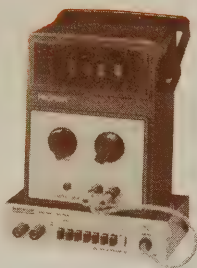
SPECIFICATIONS

Features - Basic	SS110	SS130	SS150	SS200B	CG300
1. Maximum Range	1000 ft	1600 ft	1600 ft	3200 ft	3200 ft
2. Frequency	160 kHz	160 kHz	160 kHz	155 kHz	70 kHz 280 kHz
3. Operating Voltages	12, 24, 32 VDC	24 - 32 VDC	24 - 32 VDC	24 - 32 VDC	24 - 32 VDC
4. Power Output	400W	500W	500W	700W	240W 1100W
5. Power Consumption	16W	35W	35W	<100W	<100W
6. Beam Width	7°	8°	8°	9°	14°
7. Stabilized Soundome	No	Yes	Yes	Yes	Yes
8. Tilt Range	-4°+90	-4°+90	-4°+90	-4°+90	-4°+90
9. Sweep Range	360°	360°	360°	360°	360°
10. Automatic Hoist	Optional	No	Optional	Yes	Yes
11. Presentation	Scope	Scope	Scope	Scope	Scope
12. Sector Scanning	Yes	Yes	Yes	Yes	Yes
13. Anti-Clutter	Yes	Yes	Yes	Yes	Yes
14. Construction	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
15. Audible Signal	Yes	Yes	Yes	Yes	Yes
16. Daylight Screen	Yes	Yes	Yes	Yes	Yes
17. Two Dimensional	Yes	Yes	Yes	Yes	Yes
18. Net Shipping Wt.	110 lbs	100 lbs	185 lbs	185 lbs	200 lbs
19. Size:					
Console:	12" x 17½" x 20" (Exception: SS110 - 8.5" x 13.5" x 10")				
Soundome:	Max. 7-5/8" Dia. x 18" Length. (varies according to unit.)				
Junction Box:	12" x 8½" x 2½"				
Hoist Unit:	12" x 6" x 7"				
20. Suggested Application per Wesmar Model:					
SS110:	Yachting, General Navigation				
SS130	Submersibles, full scanning capability to 5000 foot depths				
SS150	Commercial Fishing, Wreck Location, Salvaging and Surveying, General Navigation				
SS200	Research, Surveying, Pipe-laying				
CG300	Designed for Civil Government and Military				

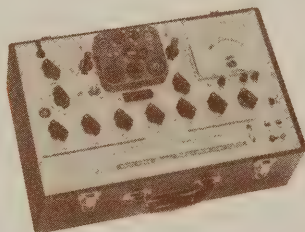
HICKOK MODEL 3300B PORTABLE DIGITAL MULTIMETER

• Measures five functions: DC/AC volts, current, and resistance • Portable and bench models • Battery operation and BCD output. Truly Portable for Field Service, the Model 3300B includes an internal rechargeable battery which provides up to 20 consecutive hours operation before it needs recharging. Ruggedly and Dependably Designed, has a high-impact plastic case with shock-mounted components to allow accurate measurements even in severe environments.

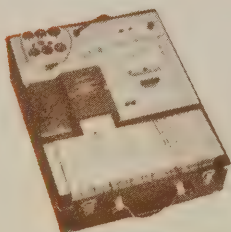
Specifications: DC Voltage: Ranges: ± 199.9 millivolts to $\pm 1,500$ kilovolts. Resolution: 100 microvolts. Accuracy: $\pm 0.1\%$ of reading ± 1 digit. Overload Protection: 1500 volts peak. • AC Voltage: Ranges: 199.9 millivolts to 1,000 kilovolt. Resolution: 100 microvolts. Accuracy: $\pm 0.5\%$ of reading ± 1 digit. Bandwidth: 22 Hz to 100 kHz. Overload Protection: 1000 volts RMS. • DC and AC Current: Ranges: 199.9 microamperes to 1,999 amperes. Resolution: 100 nanoamperes. Accuracy: DC Current: $\pm 0.2\%$ of reading ± 1 digit. AC Current: $\pm 0.5\%$ of reading ± 1 digit. • Resistance: Ranges: 199.9 ohms to 199.9 megohms. Resolution: 100 milliohms. Accuracy: ± 2 digits. • General: Accuracy Stability: 12 months; $+20^\circ\text{C}$ to $+30^\circ\text{C}$. Power Requirements: 115-230 V, 50-400 Hz. Battery: Standard with 3300B option 001 for 3301. Size, Weight: 3300B: 8" H x 5-7/8" W x 4" D (20, 32 cm x 14,92 cm x 10,16 cm); 6 lb. (2,72 kg). 3301: 3 1/2" H x 8-3/8" W x 10" D (8,89 cm x 21,27 cm x 25,40 cm); 8-3/4 lb. (3,97 kg). • 0.1% Accuracy without calibration is achieved with LSI circuitry and ultra-stable internal references. 5 Functions, 27 Ranges offer a wide range of measurement capability. Continuous Automatic Zeroing assures maximum measurement accuracy without the need for periodic zero checks and adjustments. Complete Overload Protection is provided on all ranges and functions. Convenient, In-Circuit Resistance Measurements are possible with the 3300B. Low Power Dissipation through the component under test allows the Multimeters to be used without causing breakdowns even in sensitive components as thermistors. Model 100-164 20 MHz Frequency Counter Adapter available, which greatly increases usefulness. Shown under 3300B in photo.

**MODEL 6000A TECHNICIAN'S HIGH-SPEED PORTABLE TUBE, TRANSISTOR AND DIODE TESTER**

Tests the latest tubes used in the communications industry. It makes instantaneous leakage and short tests, and G_m measurements to 15,000 micromhos.

**MODEL 123R INDUSTRIAL AND LABORATORY CARDMATIC AUTOMATIC TUBE TESTER**

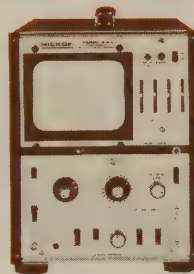
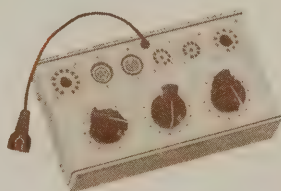
Provides card-programmed testing of tubes to handbook standards. Custom-programmed cards determine tube performance in special purpose circuits, and eliminate operator error. Complete card kits are available. Most models available with 115V or 230V power input. Write for more information.

**MODEL CA-5 UNIVERSAL ADAPTER**

Modernizes your present tube tester, enabling you to test latest tube configurations.

Duplicates all tests made by your present Mutual Conductance Tester **Specifications:** Sockets: 5 and 7-pin Nuvisors; Novar; Compactron; 10-pin.

• Applications: For Hickok Models 533A, 539B, 600A, 605A, 750, 752, 800, 1575, 6000, 6005 and Cardmatic testers. • Set-up Data: Current set-up data is furnished for all applicable models with each Adapter.

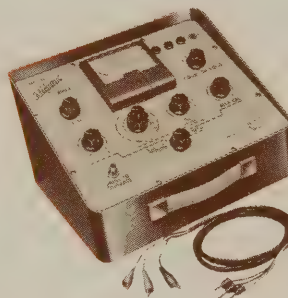
**HICKOK MODEL 5310 10 MHZ OSCILLOSCOPE**

• 10-MHz bandwidth, single trace • 5 millivolts/cm sensitivity • Large, bright display • Budget Priced

10-MHz Bandwidth is offered over the entire Model 5310 range of 10 millivolts to 50 volts. A continuously variable range vernier increases sensitivity to 5 millivolts/cm. The Model 5310 has 3% accuracy and 3-screen height undistorted deflection.

• Stable Triggering is provided for internal and external sources up to 15 MHz. No high frequency sync adjustments are needed. • Bright, Sharp Trace on a 8 x 10 cm Screen allows clear and comprehensive viewing of waveforms. • High Reliability results from a design incorporating a minimum of components and low power dissipation. With only 49 transistors and 3 ICs. • Beam Finder simplifies trace location and positioning. Auto triggering mode provides a useful base line in the absence of a signal. X-Y Operation with an external horizontal input up to 1 MHz.

Specifications: Vertical Ranges: 10 millivolts/cm to 50 volts/cm in 12 calibrated ranges with continuously variable control between ranges. • Accuracy: $\pm 3\%$. • Input Impedance: 1 megohm/30 picofarads. • Bandwidth: DC to 10 MHz, AC or DC coupled. • Triggering: Modes: Auto, triggered. Sources: Line, external, internal. Coupling: DC, AC, TVV, TVH, Field 1 and Field 2 VITS • Sweep Ranges: 0.5 microsecond/cm to 0.2 second/cm in 18 calibrated steps • CRT: 5-inch diameter; P31 phosphor; 8 cm x 10 cm display area. • Power Requirements: 105-125 or 210-250 V, 50 - 400 Hz. • Size Weight: 10" H x 8 1/2" W x 17" D (25,4 cm x 21,6 cm x 43,2 cm). 15 lb. (6,80 kg) • Dual Trace Version Also Available.

**HICKOK MODEL 890A IN-CIRCUIT TRANSISTOR TESTER**

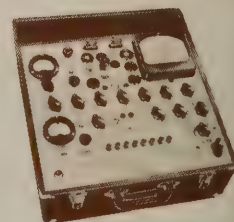
Now, for the first time, Hickok's Model 890A Dynamic Beta In-Circuit Transistor Tester enables industrial maintenance specialists, service technicians and production personnel to make in-circuit measurements on transistors — and at an accuracy of $\pm 5\%$! No other in-circuit transistor tester can measure Beta to such accuracy.

This model features: Unique circuit that measures AC Beta with equal accuracy in or out of circuit • Measures the following in-circuit parameters: AC Beta R_{in} (transistor input resistance) Z Ohms (base-emitter circuit impedance) I_c • Measures AC Beta, I_c and I_{cbo} out-of-circuit • In-circuit AC Beta measurement accuracy $\pm 5\%$ (150 ohms minimum circuit impedance) • Portable and completely self-contained.

Specifications: I_{cbo} Measurement Range: 0-50 ua Beta Ranges: 0-50, 0-100, 0-200. • Collector Test Current: Variable from 0-10 MA • Collector Test Voltages: Variable — 1.5V, 3.0V, 4.5V • Beta Test Accuracy: $\pm 5\%$ for circuit impedance above 150 ohms • I_c Range: 0-10 MA • AC Test Signal: Variable 1000 cps sine wave — Calibration setting at 5 ua base current • Transistor Input Resistance ("R_{in}, Transistor") Range: 50-10,000 ohms • Circuit Input Impedance Range: ("Z Ohms") 100 — 100,000 ohms • Meter Specifications: Sensitivity: 50 ua, 100 mv, protected against overload. • Battery Power Supply: One 22.5 volt battery Four 1.5 volt batteries.

MODEL 539C INDUSTRIAL AND LABORATORY PORTABLE TUBE TESTER

Tests the latest tubes including low-power thyatronns and 4-digit types. Micromho ranges to 60,000. Panel terminals provide access to tube elements for custom testing, such as plate current and heater current.



COLUMBIA REPRESENTS

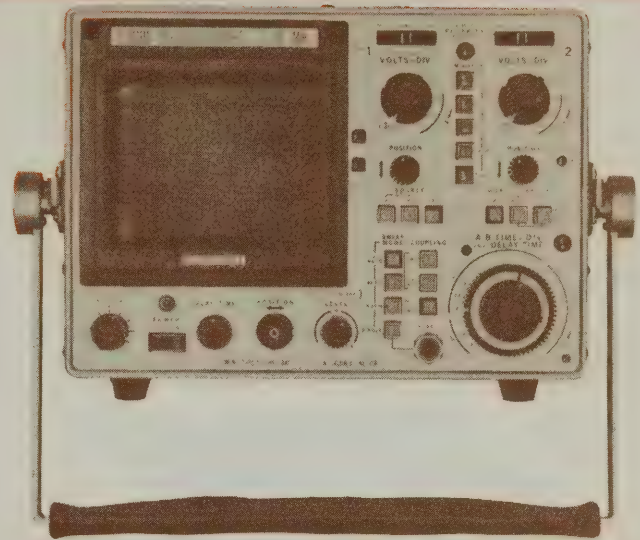
DUMONT**DUMONT**
OSCILLOSCOPE®**DUMONT MODEL 2100G 10 MHz PORTABLE OSCILLOSCOPE**

The Model 2100G has these features: 13 lb. portability, delayed sweep, 10 MHz at 10 mV/DIV, Dual Channel, 8 x 10 cm, 6.5 kV CRT, Color Coded Pushbuttons, MTBF 5000 hrs. proven in the field, single sweep capability, line sync, verniers on two vertical channels, 2.5:1 sensitivity reduction, vernier on time base, economically priced.

Specifications: General: Calibrator: Accessible with probe, 4 volts

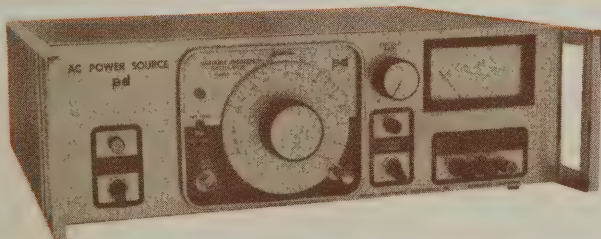
- Power: 115 V or 230 V AC, 50-400 Hz, 45 watts
- Display Area: 8 x 10 (1 div - 8 mm)
- Accelerating Potential: 6.5 kV
- Phosphor: P31, internal graticule, edge lit faceplate
- Vertical Bandwidth and Risettime: DC to 10 MHz (35 ns) from 10 mV/div to 10 V/div in two identical channels.
- Calibrated Deflection Factor: 10 mV/div to 10 V/div at full bandwidth.
- Input R and C: 1 megohm paralleled by approximately 35 pF.
- Horizontal: Calibrated Time Base: 0.5 s/div to 0.5 s/div
- X10 Magnifier: Operated over full time base, increases fastest rate to 50 ns/div.
- Delay Range: 5 us to 5 s.

Columbia can supply the entire line of Dumont Oscilloscopes and related products. Write us for data on all Dumont items.



Also available Model 2100A. Same as above except 20 MHz.

COLUMBIA REPRESENTS

PACIFIC ELECTRONICS ENTERPRISES, INC.**PACIFIC ELECTRONICS VARIABLE FREQUENCY AC POWER SOURCES**

This fully metered unit is 100% solid state, attractively styled, and lightweight. It has built-in overload protection, and a variable output of 0 to 125 VAC.

Specifications: Variable output: 0-125 VAC • Input power requirements: 110/122-V — 47/63 Hz. • Internal input for expanded frequency operation. • Internal variable oscillator (47 to 500 Hz). • Pacific Electronics AC Power Sources are designed for portable continuous duty production of AC power. These lightweight solid-state units provide reliable distortion-free power at any of the popular power frequencies, and at other frequencies with external excitation. Bandwidth is sufficient to maintain a high purity sinewave of voltage, even when load current is non-linear. Ideal for avionic work.

The following models are available:

Model	VA	Phase	Regulation			Size (H-W-D)
			Line	Load	Distortion	
250-A	250	1	.5%	.9%	.5%	5½x12x13
303-A	300	3	.5%	.9%	1%	5½x19x13
105	500	1	.25%	.9%	.75%	5½x19x13
110	1000	1	.25%	.9%	.75%	10x19x15
315	1500	3	.25%	.9%	.75%	10x19x17
120	2000	1	.25%	.9%	1%	29x19x24
130	3000	1	.25%	.9%	1%	29x19x24
160	6000	1	.25%	.9%	1%	42x19x24
330	3000	3	.25%	.9%	1%	29x19x24
360	6000	3	.25%	.9%	1%	42x19x24

Contact Columbia for all products manufactured by Pacific Electronic Enterprises Inc.

COLUMBIA REPRESENTS

SOUTHERN AVIONICS CO.**SOUTHERN AVIONICS MODEL SS-800 80W SOLID STATE LF RADIO BEACON TRANSMITTER**

A compact beacon, ideal for airport or shipboard installation. Widely used at off-shore oil well installations.

Specifications: Meets FAA, FCC & ICAO specifications • Frequency Range: 190 to 650 kHz

- Frequency Tolerance: .003%
- Power Requirements: 115/230 volts AC ± 10%, 50-60 cycles with provision for 48 VDC operation.
- Power Output: A big 80 Watts Carrier with Peak Power during modulation of 150 watts
- Power

- Consumption: 250 watts
- Battery Current Drain: 5 amps
- Identification Code: International Morse
- Modulation: 1020 Hz or 400 Hz
- Safety Features Include: Lightning Arresters Line Surge Voltage Protectors, De-Tuning Protection
- Solid State Electronics
- Housing is in a weather-resistance enclosure made of 5052-H32 Aluminum that has been anodized for further protection. It is 24" high, 12" wide, 6" deep, made for pole mounting out-of-doors.
- Weight: Less than 45 lbs.

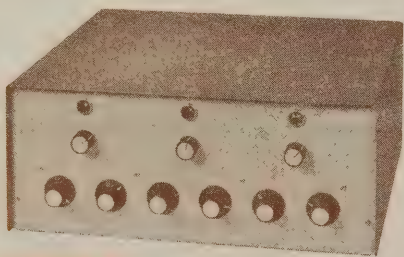
Columbia can supply the entire Southern Avionics line of solid state LF Radio Beacons, including the 25 and 40 W models, as well as antennas. Contact us for more details on any of these items.

COLUMBIA REPRESENTS

MIECO

MIECO
**MODEL P-37 SCRAMBLER**

A rolling speech scrambler — the ultimate in privacy for radio and land line communications. Defies decoding even by tape and computer analysis. 5-band voice split code is rearranged every .5 second on a pseudo random basis. Tens of thousands of code combinations available for use to give maximum security. Unbreakable even by other units in same network unless properly coded. Has self-contained power supply; operates on 110/220V, 50/60 hertz or 12 vdc power but automatically reverts to 12 vdc if main power source fails. Simplex: Duplex.

**MODEL P-35 SCRAMBLER**

For use with all AM-FM-SSB radio communication equipment. Can be used with standard land line systems with coupling or connection equipment. 5-band division of speech spectrum allows high degree of security since each band can remain erect or be inverted. Has send and receive gain controls and related level indicator. Transistorized, compact, easily installed and serviced.

**MODEL P-10 SCRAMBLER**

For all types of FM & AM 2-way radios. 25-channel selection. Can be put in or out of service by turning a switch. Radio microphone and speaker used without loss of intelligibility or level. Fully transistorized. Designed for rapid underdash mounting and easy service.

**MODEL P-25 SCRAMBLER**

For telephones. Portable, self-contained scrambler for 2 or more users (of public or private phones). 25 codes available for use before or during conversation. Conference calls have 5 codes available. Signal prevents battery drain if power switch is left on after use.

COLUMBIA REPRESENTS
WORLD POWER

WORLD POWER



ALTERNATORS

OPTIONAL EXTRAS
Must Be Factory Installed

RC 101 - Remote Control, available on electric models ESB2800TE, ESB2800TEDV, ESB3800TE, ESB3800TEDV

RC 101 - W - Remote Controls for ESW4500 TEDV and ESW5000 TEDV

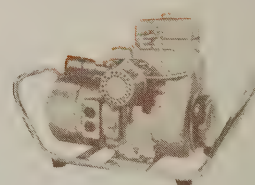
LP - 102 LP Gas Conversion available on all models

LP - 102 R & A - For Electric start models with remote and automatic starting

S - 103 Silencer - for all models

S - 104 - Electronic Brain idler available on all plants except Wisconsin. Not recommended on models with automatic load demand control.

S - 104 - W - Electronic Brain idler for all Wisconsin Engines.



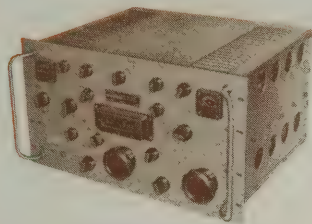
MODEL	WATTS	VOLTS A.C.	AMPS	Hz	4 CYL. ENG HP	ENGINE GOV.	START	NET WT. LBS.	SHIP WT. LBS.	DIMENSIONS INCL. SKID OR FRAME		
										L	W	H
EST1200	1200	115	11	60	2 3/4	MECH.	ROPE	60	76	16 1/2	15	12 1/2
ESB1500	1500	115	13	60	3	MECH.	RECOIL	70	85	28	15	14 1/2
EST1750	1750	115	16	60	4	MECH.	RECOIL	80	90	28	17 1/4	16 1/2
ESC1750TE	1750	115	16	60	4	MECH.	ELEC.	85	95	28	17 1/4	16 1/2
ESB2800	2800	115	23	60	7	MECH.	RECOIL	110	130	28	17	17 1/2
ESB2800DV	2800	115/230	23/11 1/2	60	7	MECH.	RECOIL	115	135	28	17	17 1/2
ESB2800TE	2800	115	23	60	7	MECH.	ELEC.	130	150	28	18	18
ESB2800TEDV	2800	115/230	23/11 1/2	60	7	MECH.	ELEC.	135	155	28	18	18
ESB3800	3800	115	34	60	9	MECH.	ROPE	170	205	30	20	20
ESB3800TE	3800	115	34	60	9	MECH.	ELEC.	210	245	30	22 1/2	20
ESB3800DV	3800	115/230	34/17	60	9	MECH.	ROPE	175	210	30	20	20
ESB3800TEDV	3800	115/230	34/17	60	9	MECH.	ELEC.	215	250	30	22 1/2	20
ESW4500DV	4500	115/230	40/20	60	10	MECH.	ROPE	205	240	30	20	24
ESW4500TEDV	4500	115/230	40/20	60	10	MECH.	ELEC.	240	275	30	23	24
ESW5000DV	5000	115/230	46/23	60	12	MECH.	ROPE	215	250	30	20	24
ESW5000TEDV	5000	115/230	46/23	60	12	MECH.	ELEC.	250	285	30	23	24
ESB2500TE-3012	2500	115/DC12	22/DC30	60	7	MECH.	ELEC.	135	155	28	18	18

CODE: T-Tecumseh, C-Clinton, B-Briggs, W-Wisconsin, TE-Electric Start, DV-Dual Voltage.

OTHER MODELS AVAILABLE ON REQUEST — All plants operate at 3600 R.P.M. Write for quotations.

MF & HF RECEIVERS

All succeeding pages, from here to the end of the catalog, are devoted to the listing of Columbia's proprietary, on-the-shelf, new, like new, reconditioned and used surplus items, available for immediate delivery.



R-390/URR • R-390A/URR COMMUNICATIONS RECEIVERS

The R-390A/URR is a high performance, exceptionally stable general purpose triple conversion communications receiver. This set designed by Collins Radio for the U.S. Army is widely used wherever extreme accuracy is desired. It incorporates 4

mechanical filters to provide very sharp selectivity. The frequency dial has a digital presentation. The receiver incorporates plug-in modules to facilitate repairs. This set uses a permeability tuned oscillator to achieve the frequency stability. The B.F.O. also uses a P.T.O. **Specifications:** Frequency range: 500 kc to 32,000 kc • IF selectivity: 100 cps to 16 kc • Type of Reception: CW, AM, Tone, FSK • Output Impedance: 600 ohms • Power Input: 110/220 VAC 50/60 cps 1 Ph. Also available: R-390/URR Radio Receiver. Same in appearance as R-390A/URR. Same specifications as R-390A/URR but does not use mechanical filters.

R-391/URR RADIO RECEIVER

Same appearance as R-390A/URR.

Specifications: The R-391/URR is almost identical to the R-390/URR except that it has a builtin eight channel Collins Autotune. The set can also be manually tuned. The specification for this set are the same as the R-390/URR. In addition to the 110 VAC 60 cps a voltage of 24 VDC at 5 amps is required to operate the Autotune system.

R-389/URR V.L.F. RADIO RECEIVER

Same appearance as R-390A/URR. The R-389/URR designed by Collins Radio is a dual conversion superheterodyne Radio Receiver which tunes 15 - 1500 kc. This set features a motor-controlled band changing switch. This set is recommended where exceptional frequency stability and accuracy are required. It is very similar to the R-390A/URR in appearance and has the same type of digital frequency tuning.

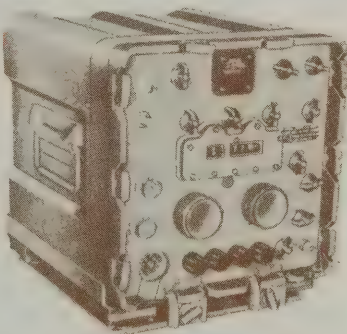
Specifications: Frequency Range: 15 to 1500 kc (2 ranges, 7 bands) • Type of signals received: A1, A2, A3, F1 • IF Frequency: 10 mc and 455 kc • Tuning methods: manual or motor tuning • Power requirements: 115/230 VAC 48/62 cps 1-phase • Number of tubes: 36 • Weight: 86 lbs.

CY-979/URR a heavy duty aluminum table top cabinet for the R-389/URR, R-390/URR, R-390A/URR & R-391/URR includes shock mounts and shielded air vents on two sides.

R-392/URR RADIO RECEIVER

High performance, compact, rugged receiver designed by Collins Radio primarily for vehicular use. It is also part of the AN/GRC-19 Radio Set. Somewhat similar to the R-390/URR in design principles. The filament and B+ voltage are 24 VDC.

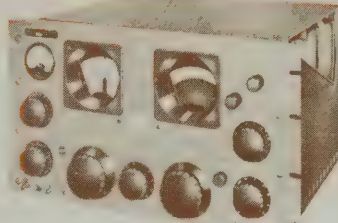
Specifications: Frequency Range: 500 kc to 32 mc in 32 bands • Type of circuit: triple and dual conversion (25 tubes) • Type of tuning: continuous • Power input: 24/28 VDC at 3 amps • Dimensions: 11½" H x 14" D x 11" L • Weight: 52 lbs.



BC-348 RADIO RECEIVER

An eight tube, six band highly sensitive and selective Communications Receiver covering 200-500 kc and 1.5-18 mc. This Receiver is very popular because of its reliability, ruggedness and light weight. Features: 2 RF Amplifiers, 3 IF

Amplifiers, Crystal Filter, AVC and MVC Control and BFO Control. Designed for 24 VDC operation, but can be easily modified for 110 VAC. **Specifications:** Freq. Range: 200-500 kc and 1.5-18 mc (6 bands) • IF Freq: 915 kc • Output Impedances: 300 or 4000 ohm • Output Power: 3 watts • Power Input: 24 VDC • Dimensions: 10" H x 18" W x 10" D • Weight: 38 lbs.

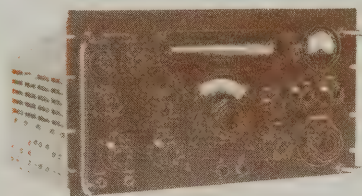


SP-600JX HAMMARLUND COMMUNICATIONS RECEIVER

The Hammarlund SP-600JX is one of the most popular professional dual conversion communications receivers available and has been in continuous production for over 20 years. It is ideal for radio teletype use because of the 6 channel crystal

control provision as well as variable tuning. It is designed for rack mounting.

Specifications: Frequency range 540 kc to 54 mc in 6 band, 20-tube circuit • Type of reception: CW, AM • Tuning: variable or (6 channels crystal controlled) • Output power: 2.5W • Output Impedance: 600 ohms C.T. • Power Input: 110/220 VAC, 50/60 cps 1 phase • Dimensions: 19" W x 12" H x 22" D • Weight: 60 lbs. SP-600J: Same as above but less crystal control feature • We can supply SP-600JX series receivers, factory modified, to receive SSB signals.

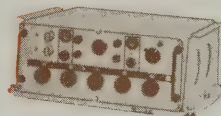


R-388/URR • COLLINS 51J-3 RADIO RECEIVER

A Professional Communications Receiver manufactured by Collins Radio. This set has exceptional frequency stability and Calibration Accuracy. The Receiver covers the Fre-

quency of .5 to 30.5 mc in 30 bands. This set has single, double and triple conversion. Some of its features are: Crystal Filter, Input and Output Meter Crystal Calibrator, RF and Audio Gain Control, BFO Control, and 30 Bands of 1 mc each.

Specifications: Frequency Range: .5 to 30.5 mc (30 bands in 1 mc steps) • IF Frequency: 50 kc • Sensitivity: AM Single of 5 UV to produce 500 MV output at a signal to noise ratio of 10 to 1 • Selectivity: 2-20 kc Variable • Crystal Calibrator: Every 100 kc • Output Impedances: 4 and 600 ohms • Power Input: 115/230 VAC, 47/70 cps 85 watts • Dimensions: 10½" H x 19" W x 13" D • Weight: 38 lbs.



R-1051/URR HF COMMUNICATIONS RECEIVER

Designed by General Dynamics, this is one of the U.S. Navy's most modern solid-state general purpose communications receivers. This digitally tuned receiver covers the frequency range of 2 to 30 MHz continuously or in crystal controlled channels spaced 1 kHz apart.

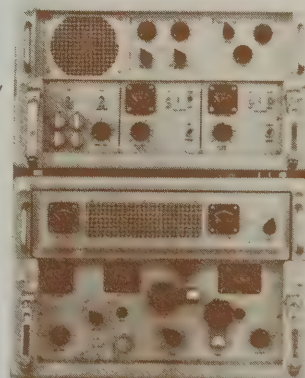
Specifications: Frequency Range: 2 to 29.995 MHz • Receiver Modes: am, cw, mcw, fsk, usb, lsb, isb • Sensitivity: 1 UV for 10 dB signal pulse noise/noise • Receiver Stability: 1 part in 10⁷ per week. • Receiver Bandwidths: SSB 3.2 kHz, am and cw 6 kHz. • Dimensions: 7 in. D x 18 in. W. • Weight: 25 lbs.

AN/WRR-2 & AN/FRR-59

One of the Navy's latest and most sophisticated receivers designed by the National Company for General Purpose use aboard ship, or in shore stations. Extreme accuracy is achieved by means of a crystal controlled internal frequency standard.

AN/FRR-59 is the shore station version of the AN/WRR-2. It is identical except it does not use the heavy duty vibration mounting cradle. It can be mounted in a standard 19 in. wide equipment rack. These receivers are also available with .5 kHz in lieu of 1 kHz incremental tuning.

Specifications: Frequency Range: 2-32 MHz in 4 bands. • Receiver Modes: CW, AM, MCW, ISB, SSB, FSK, FAX. • Tuning: Increments (1 kHz spacing) or continuous. • Stability and Accuracy: 1 part in 10⁷ per day. • Power Requirements: 115V/60 Hz/1 PH. • Dimension: 23" x 20" x 23". • Weight: 250 lbs.





VHF & UHF RECEIVERS

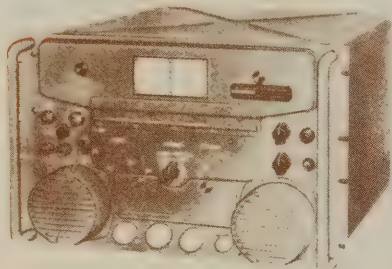


R-484/APR-14 VHF & UHF RADIO RECEIVER

Originally designed by Raytheon for the U.S.A.F. as a countermeasures receiver for airborne use. Receives AM and FM signals in the frequency range of

30- 1000 MHz and presents a visual indication of these signals on a panoramic display tube.

Specifications: Frequency Range: 30 - 1000 MHz in 3 bands. • Receiving Modes: AM, FM or Pulse. • Panoramic Display: 3 MHz each side of center frequency in one MHz steps. • Power Requirements: 115V/380 - 1000 Hz/1 PH.



R-278/GR UHF RADIO RECEIVER

A UHF Ground Station AM Superheterodyne Receiver designed by Collins Radio. The R-278/GR provides reception of AM and CW signals on any one of 1750 Channels in the Freq. Range of 225 to 399.9 mc and simultaneously on one fixed tuned

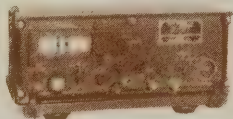
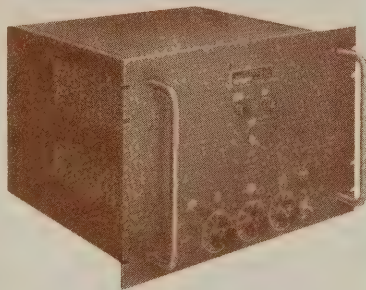
Channel in the Freq. Range of 238 to 248 mc. This Receiver is a part of Radio Sets AN/GRC-27, AN/GRC-29 and many others and is designed to receive signals from Radio Sets, AN/ARC-51, AN/ARC-27, AN/ARC-34, AN/ARC-52 and other Radio Sets. This is one of the very latest UHF Military Receivers to become available on the surplus market and is ideal for airport use. Will fit standard 19" wide rack.

Specifications: Freq. Range: 225.0 to 399.9 mcs • Freq. Control: Crystal • Number of Channels: 1750 spaced at 100 kc intervals • Number of Preset Channels: 10 • Selectivity: 85 kc at 6 dB • Attenuation 115/230 V 50/60 cps • Dimensions: 13" H x 19" W x 20" D • Weight: 115 lbs.

AN/GRR-7 • R-361/GR UHF RADIO RECEIVER

A single channel crystal controlled rack mounted set used for fixed-station, ground to air communications at airports. This receiver is part of the AN/GRR-7 Radio Receiving Set widely used by the U.S.A.F.

Specifications: Freq. Range: 225-399.9 mc • Preset Channels: 1 (Crystal controlled) • Type of Receiver: Superheterodyne • Type of signals received: Voice and CW • Input Impedance: 52 ohms • Output Impedance: 600 ohms • Sensitivity: 3 UV • Power Requirements: 115/220 VAC 50/60 cps 1-phase 140 watts.

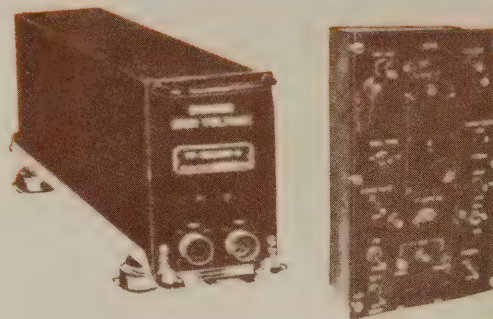


R-744/PRR VHF RECEIVER

A very compact, sensitive vehicular or portable radio receiver used for intercept and direction finding in the frequency range of 20-100 MHz. Can receive AM, FM, CW and MCW signals Power Requirements: Internal dry batteries or 24 VDC vehicular battery.

NAVAL ECM RECEIVING EQUIPMENT

Columbia can supply from stock the following popular naval ECM receiving sets, antennas and accessories. AN/BLR-1 Receiving Set 90-10,700 MHz. AN/SLR-2 Receiving Set 90-10,700 MHz. AN/WLR-1 Receiving Set 50-10,750 MHz. AN/WLA-2A R-F Pre-amplifier - Control Group for AN/BLR-1 and AN/SLR-2. AS-570/SLR DF Antenna 2300-10,750 MHz. AS-571/SLR DF Antenna 300 - 600 MHz. AS-616/SLR DF Antenna 550-2600 MHz. AM-1017/SLR DF Antenna Control Amplifier. C-1609/SLR DF Antenna Control.



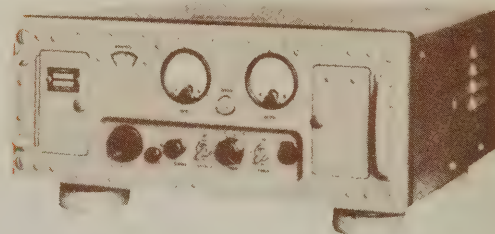
AN/APR-9 UHF COUNTERMEASURES RECEIVING SET

One of the very latest airborne countermeasures sets to be released on the surplus market. This system uses four RF tuners, each containing an RF preselector, a local oscillator, a crystal mixer and an IF pre-amplifier. The IF output of the tuners is 160 mc. The four tuners are remotely electrically tuned by means of a reversible DC motor in each tuner. These tuners have a band width of 20 mc. One common control box controls all tuners and indicates the frequency of the tuners. The system also includes a panoramic indicator to give visual spectrum analysis, and a mixer-amplifier dual conversion converter unit as well as two power supplies. The AN/APR-9 system requires a power input of 115 VAC 400 cps 1-Ph and 24 VDC at 5 A.

Principal components: TN-128/APR-9 RF Tuner 1000 - 2600 mc • TN-129/APR-9 RF Tuner 2300 - 4450 mc • TN-130/APR-9 RF Tuner 4300 - 7350 mc • TN-131/APR-9 RF Tuner 7050 - 10,750 mc • CV-43/APR-9 Mixer - IF Amplifier • ID-226/APR-9 Panoramic Indicator • C-426/APR-9 Receiver Control Box • PP-336/APR-9 Power Supply • PP-337/APR-9 Klystron Power Supply • AN/APR-9 Junction Relay Box.

AN/APR-13 COUNTERMEASURES RECEIVING SET

This unit is very similar to the AN/APR-9 and uses some common components. It covers the frequency range of 50 - 1100 MHz in 4 Bands. Can be interfaced with the AN/APR-9 to form the AN/ALR-8 Countermeasures Receiving Set.



AN/URR-13 UHF RADIO RECEIVER

A general purpose compact communications receiver unit designed to provide UHF reception on naval vessels and shore stations. It is used in conjunction with the TED Radio Transmitter. For shore stations this set may be rack mounted. The set may be operated on a single crystal controlled channel or may be variable tuned without crystals to the desired frequency. This set is a single conversion superheterodyne with a self contained power supply.

Specifications: Freq. Range: 225 to 400 mc • Type Reception: Voice or MCW • IF Freq.: 18.6 mc • Audio Output: 600 ohms • Antenna Input: 50 ohms • Power Requirements: 110 VAC 50/60 cps 1-phase 125 watts • Dimension: 9" H x 18" D x 19" W • Weight: 60 lbs.

AN/URR-35 UHF RADIO RECEIVER

The AN/URR-35 is the same as the AN/URR-13 except that it has a dual conversion superheterodyne circuit. All of the specifications are the same as the AN/URR-13.

AN/URR-27 VHF RADIO RECEIVER

The AN/URR-27 Radio Receiver is the same as the AN/URR-13 except that it covers the freq. range of 105 to 190 mc. All other specifications are the same as the AN/URR-13.

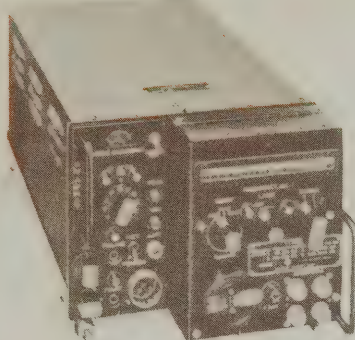
All versions of AN/URR-13, AN/URR-27 and AN/URR-35 are available, including AN/URR-35C and AN/URR-27A. Write for data.



VHF & UHF RECEIVERS

AN/ALR-5 • R-444/APR-4Y • SURVEILLANCE RECEIVER

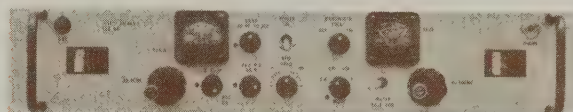
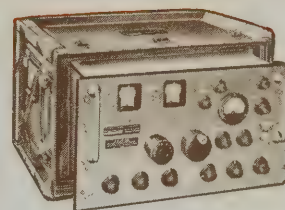
Set incorporates a modern circuit capable of receiving AM, CW and FM signals. The R-444/APR-4Y has all the features of the older R-54/APR-4. The R-444/APR-4 Receiver was originally supplied with a 110 VAC 400 cps power supply. The AN/ALR-5 system uses the CV-253/ALR, a very modern design, hi-sensitivity plug-in tuning unit which tunes 38 to 1000 mc in four bands. The R-444/APR-4Y can also be used with any AN/APR-1 or AN/APR-4 tuning unit. Principal Components: R-444/APR-4Y Radio Receiver 110 VAC 400 cps. • R-444/APR-4Y can be factory converted to 110 V 60 cps. • CV-253/ALR Tuning Unit 38 to 1000 mc. • TN-19/APR-4 Tuning Unit 975 to 2200 mc. • TN-54/APR-4 Tuning Unit 2150 to 4000 mc.



R-220/URR VHF & UHF RADIO RECEIVER

Manufactured by Motorola for the U.S. Army. It is used for General Monitoring and Direction Finding Applications. The Receiver is a major component of the AN/TRD-10 Direction Finding Set.

Specifications: Frequency Range: 20 - 230 mc • Type Reception: AM, CW, FM, FSK. • Power Requirements: 115 or 230 V/48-62 cps/1 Ph. • Size: 19" W x 10½" H x 15" D. • Weight: 120 lbs.



R-1283/GRC VHF & UHF RADIO RECEIVER

Designed for the U.S.A.F. by Airborne Instruments Laboratory to serve as a general purpose monitoring and surveillance receiver. Covers the range of 30 to 300 MHz in two bands. All circuitry is solid state with the exception of the RF amplifiers. Has 3 selectable IF bandwidths: 3 MHz, 300 kHz and 60 kHz. Capable of receiving AM, FM, CW and Video Signals. Power Input: 115/1/60.

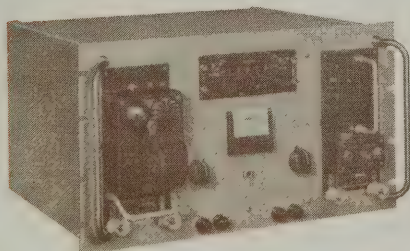
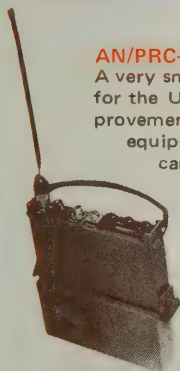


VHF & UHF RECEIVER-TRANSMITTERS

AN/PRC-66B PORTABLE UHF TRANSCEIVER

A very small portable solid-state, compact transceiver designed for the U.S.A.F. by Collins Radio. It offers considerable improvement in weight, size, performance and reliability over any equipment of its type in use today. This set can be hand carried or vehicular mounted.

Specifications: Frequency Range: 225.0 - 399.95 MHz in 3500 channels spaced 50 kHz apart. • Power Output: 2 watts AM. • Power Requirements: Internal rechargeable nickel cadmium battery or alkaline disposable battery or 24 VDC external power source. A solid-state 10 watt RF amplifier is also available to increase the range of this set.



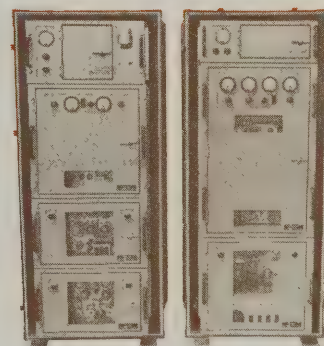
COLUMBIA VHF-201 VHF GROUND-TO-AIR COMMUNICATIONS SYSTEM

A small, lightweight, reliable multi-channel VHF airport ground radio station utilizing the Collins 51X-2B receiver and 17L-7A transmitter. This system may be locally or remotely controlled. All self-contained in a compact cabinet.

Specifications: Frequency Range: 116 - 149.95 MHz in 680 channels spaced 50 kHz apart. • RF output: 25 watts. • Power Source: 115V or 230V, 50-60 cps, 1 Ph. • Size: 19" W x 10½" H x 15" D. • Weight 75 lbs. A similar system can also be supplied using the Wilcox 807A transceiver.

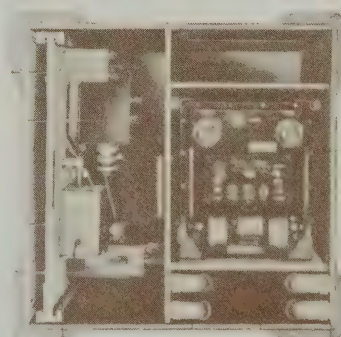
AN/TRC-29 MICROWAVE RADIO SET

A 23-channel microwave radio set designed by ITT for the U.S. Army. Meets the most severe military requirements. Can transmit and receive voice, television or teletype signals. Operates in the frequency range of 1700 - 2400 MHz with an RF output of 10 watts FM. This equipment is very rugged and is designed for long years of trouble-free operation.



AN/GRC-32 UHF RADIO SET

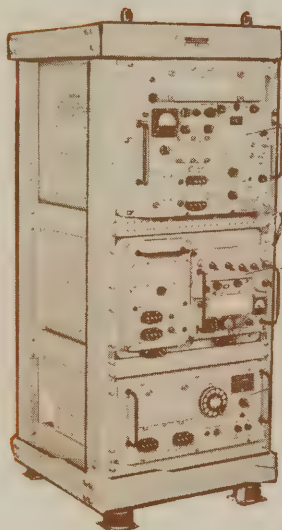
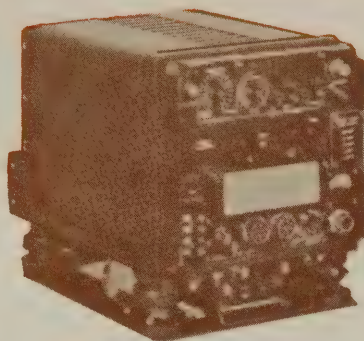
Radio Set AN-GRC-32 is a 1750 channel UHF crystal controlled ground to air communication installation. The principal components are: one RT-178/ARC-27 Transceiver, one PP-894/GRC-32 AC Power Supply, control boxes, cables, antenna and carrying cases.



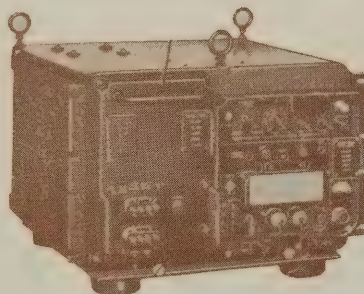


UHF RECEIVER-TRANSMITTERS

AN/VRC-24



AN/SRC-20



AN/TRC-68

AN/SRC-20 • AN/SRC-21 • AN/URC-9 • AN/TRC-68 AN/VRC-24 UHF RADIO SETS

Radio Sets AN/SRC-20 and AN/SRC-21 were designed for the U.S. Navy by Collins Radio for shipboard or shore stations. The AN/URC-9 radio transceiver is part of the AN/SRC-20 and AN/SRC-21. It can also be used alone. The AN/TRC-68 is the U.S. Army and U.S. Air Force version of the AN/URC-9. It is the same except for the remote control circuits and electrical connectors. The AN/VRC-24 is the vehicular version of the AN/TRC-68. It uses the same type of transceiver but has a 24 VDC dynamotor in place of the AC blower motor. The AC power supply is eliminated and its cabinet size reduced. The AN/SRC-20 includes the AM-1565/URC 100 watt output RF power amplifier. The AM-1565/URC can also be used with the AN/TRC-68 radio set or similar sets. **Specifications:** Frequency: 225 - 399.9 mc. • Channels: 19 preset plus manual local or remote control. • Channel Selection: 1750 automatically — selectable channels spaced 100 kcs apart. • Power Output: AN/SRC-20 100W AM, all others 16W AM. • Power Input: 115 or 220V/50-60 cps/1 Ph except AN/VRC-24 which is 24 VDC. Squelch: Yes. • Remote Control Provisions: Yes. • Write for more detailed specifications or quotation.

A 3500 channel with 50 kHz spacing version of these radio sets is also available. The model numbers are as follows: AN/URC-9A, AN/SRC-20A, and AN/SRC-21A.

AN/PRC-41 UHF RADIO SET

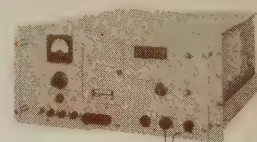
A very compact lightweight portable UHF transceiver made for the U.S. Air Force and Marine Corps, by Collins Radio. This set is partially solid-state and can be man-packed or mounted on a vehicle with a 24 VDC electrical system.

Specifications: Frequency Range: 225 - 400 mc in 100 kc increments. 1750 preset channels
• RF Output: 3 watts AM
Power Input: 24 VDC. •



AN/GRC-171 UHF RADIO SET

The USAF's very latest high performance uhf transceiver designed for air traffic control communications. The equipment is completely solid-state, providing AM communications on any one of 7,000 channels in the 225- to 399.975 MHz band with 20 watts AM carrier output. Plug-in modular construction and built-in test facilities. The solid-state power amplifier is ruggedized for operation into high antenna vswr's under severe environmental conditions.



AN/GRC-27 100W UHF RADIO SET

A 1750 channel crystal controlled UHF ground to air radio communication installation used for two-way control tower to aircraft communications in the frequency range of 225 to 399.9 mc. The AN/GRC-27 is principally composed of the R-278/GR Radio Receiver, the T-217/GR and the MD-129/GR modulator. The installation also includes mounting rack, antenna and cables.



THE COLUMBIA BRAND OF CONFIDENCE

Because the operations of Columbia Electronics are world wide in scope, most transactions are conducted by mail, telephone and telegraph.

We have been doing business with some customers for over a quarter of a century — and have never met them face to face. As a matter of fact — we are doing business with the 2nd generation — the sons of original customers! That fact, more than anything we can say, highlights the confidence we have in them, as buyers — and the confidence they have in Columbia, as suppliers.



VHF & UHF TRANSMITTERS & RF AMPLIFIERS

AM-1565/URC 100W UHF POWER AMPLIFIER

A self-contained linear RF amplifier that can be used with any exciter having a minimum output of 10 watts. This unit has provisions for 19 preset channels and one manual continuously tuned channel. This unit was originally designed by Collins Radio and is part of the AN/SRC-20 and AN/SRC-20A radio sets. They are now widely used as independent units.

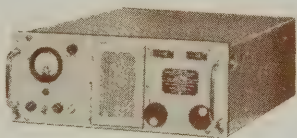
Specifications: Frequency Range: 225 - 399.9 MHz. • RF Input Power: 10 - 24 watts. • Preset Channels: 19 plus one manual. • Minimum Power Output: 100 watts average carrier. • Size: 19" W x 15 1/4" H x 21 1/4" D. • Weight: 215 lbs.



AM-1365/URT 100W UHF RF AMPLIFIER

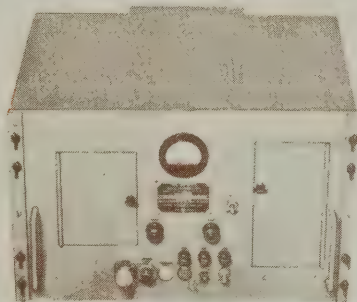
Manufactured for the U.S. Navy by Hallicrafters Manson Laboratories Division. The AM-1365/URT was designed to amplify the 15 watt output of the Navy TED series radio transmitters. This unit can be mounted in a standard 19" wide rack.

Specifications: Frequency Range: 225 - 400 mc, continuously tunable, one band • Power Output: 100 watts • Output Impedance: 50 ohms • Input Power: 15 watts, AM, FSK, or SSB • Power Requirements: 115/230V/1 Ph/60 cps • Size: 19" W x 7" H x 21" D.



TED UHF RADIO TRANSMITTER

A compact UHF radio transmitter designed for ground to air or ship to air voice communications. This transmitter provides four preset crystal controlled voice or MCW channels on frequencies between 225 to 400 MCS. The TED has its own cabinet for desk mounting or it may be mounted in a standard 19" wide relay rack. The TED



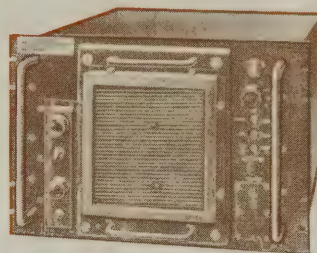
uses two 4 X 150A tubes in push-pull plate and screen modulated power amp. The modulators are two 807 tubes.

Specifications: Frequency Range: 225 to 400 mc • Frequency Control: Crystal CR-24/U Holder • Preset Frequencies: One • Carrier Output: 15W • Type Emission: AM and MCW • Input Impedance: 600 ohms for Microphone • Output Impedance: 50 ohms to antenna • Power Input: 115/230 VAC, 50-60 cps, 1 Ph 750W • Dimensions: 19" H x 25" W x 23" D • Weight: 190 lbs Net • All models in the TED series are in stock, including the TED-9.

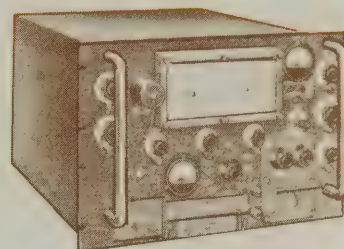
AN/URT-7 VHF RADIO TRANSMITTER

Same Appearance as TED. Functional Description: A single channel crystal control transmitter designed for Naval shipboard and ground stations. It is almost identical to the TED series but covers the VHF aircraft band. It can be rack mounted if removed from its cabinet.

Specifications: Frequency Range: 115 to 156 mc • Frequency Control: crystal • Frequency Stability: plus-minus .007% • Type Emission: CW, MCW, voice • Power Output: 30W nominal • Microphone Input: 600 ohms • Antenna Impedance: 50 ohms • Power requirements: 115/230 VAC 50/60 cps 1 Ph. 750W • Dimensions: 14" H x 17" D x 10" W • Weight: 150 lbs. All models in the AN/URT-7 series are in stock, including the AN/URT-7D.



MD-141/GR



T-282/GR

AN/GRT-3 UHF 100 WATT RADIO TRANSMITTING SET

A 100W UHF single channel crystal controlled ground transmitter which covers the frequency range of 225 to 399.9 mc. It consists of the T-282/GR radio transmitter and the MD-141/GR modulator power supply. This set is widely used by the U.S.A.F. as a ground to air transmitter at airports. Used in conjunction with the R-361/GR radio receiver and may be rack mounted.

Specifications: Frequency Range: 225 to 399.9 mc • Preset Frequencies: one (crystal controlled) • Type of Emission: Voice • Output Power: 100W • Output Impedance: 52 ohms • Power Input to MD-141/GR: 115/220V 50/60 cps 1-Ph. • Dimensions: T-282/GR: 19" W x 13" H x 20" D • MD-141/GR: 19" W x 13" H x 20" D. Principal Components: T-282/GR Radio Transmitter • MD-141/GR Modulator Power Supply • Set of Interconnecting Cables.

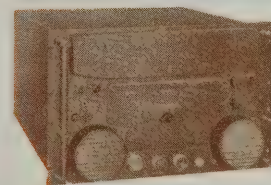
AN/URW-14 RADIO CONTROL TRANSMITTING SET

The U.S. Navy's most popular FM Transmitter designed to send control data to target drones and pilot-less aircraft. Operates on a single predetermined crystal controlled frequency in the 406 to 549.5 MHz range. Has a minimum RF output of 75 watts, includes 20 audio tone generators.

This set is part of the AN/SRW-4 Drone Aircraft control system.



MD-129/GR



T-217/GR

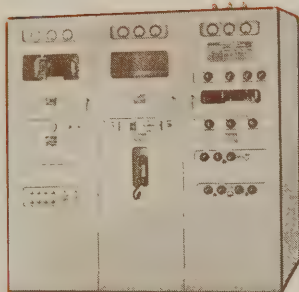
T-217/GR 100 WATT UHF RADIO TRANSMITTER

Radio Transmitter T-217/GR and its associated modulator-power supply constitute a 100W output UHF ground station transmitter covering the frequency range of 225 to 399.9 mc. Manufactured by Collins Radio and part of radio sets AN/GRC-27, AN/GRC-29 and AN/TRC-32 The companion receiver for this transmitter is the R-278/GR. Ideal for airport installation.

Specifications: Frequency Range: 225-399.9 mc A3 and A2 1020 cps • Frequency Stability: $\pm 0.1\%$ • Frequency Control: 38 crystals, internal • Channels: 1750 manual or 10 preset • Channel Spacing: 100 kc • Power Output: 100W. Microphone: Carbon • Output Impedance: 52 ohms • Power Input: MD-129/GR 115/230 VAC 50/60 cps, 1 Ph. • Dimensions: T-217/GR 12" H x 19" W x 20" D. • Weight: 130 lbs., MD-129/GR 12" H x 19" W x 20" D • Weight: 140 lbs. Principal Components: T-217/GR Radio Transmitter, MD-129/GR Modulator Power Supply.



HF TRANSMITTERS & RF AMPLIFIERS



AN/FRT-15 HF 3KW TRANSMITTER

A medium power Radio Transmitter manufactured by RCA for Navy shore stations and for aeronautical ground stations. This equipment is capable of continuous operation. The appropriate frequency may be selected automatically either locally or remotely.

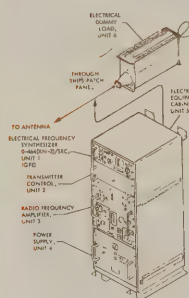
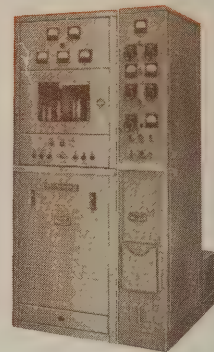
Specifications: Frequency: 2-30 mc. continuous over entire range • Channels: 10 Preset, 1 manual. • Frequency Control: Crystal or Master

Oscillator. • Power Output: 2-12 mc 3000 W, 12-30 mc 2500 W. • Emission: CW, MCW, AM, FSK, FAX, SSB. • Power Input: 220 V/50-60 cps/3 Ph.

WESTINGHOUSE MW-2 3KW HF SSB TRANSMITTER

The Westinghouse Model MW-2 is a medium power transmitting set designed for point to point service. This set comprises rectifier, modulator unit, control unit and RF amplifier unit. A maximum of three RF amplifiers can be used with one rectifier. The modulator is optional.

Specifications: Frequency Range: 2-30 mc. • Power Output: 3 Kw. • Frequency Control: Determined by external exciter (not included). • RF Input Required: 1 watt (2-4.5 mc). • Type of Emission: AM, CW, SSB, FSK, FAX • Power Requirements: 210-250 V/50-60 cps/3 Ph.



AN/WRT-4 HF 1 KW RADIO TRANSMITTER

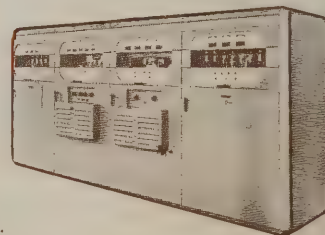
A compact HF CW transmitter manufactured for the U.S. Navy primarily for submarine installation where space is at a premium. Frequencies are generated by a frequency synthesizer manufactured by Manson Laboratories Division of Hallicrafters. Frequency Range: 2 to 32 MHz. Primary Power Input: 120V/3 Ph/400 Hz 7000W •

Dimensions: 55 in. H x 22 in. W x 28 in. D

AN/FRT-22 HF 40 KW TRANSMITTER

A High Power Radio Transmitter manufactured by Collins Radio for the U.S. Army to provide reliable point to point communications over very long distances. It is designed for SSB Service and can be excited with a low level SSB excitation input.

Specifications: Frequency Range: 4-26.5 mc • Frequency Control: Master Oscillator or Crystal. • RF Output: A1: 40 Kw, F1: 40 Kw, F4: 40 Kw, SSB: 30 Kw. • Preset Channels: 10 Servo controlled. • Power Requirements: 230V/50-60 cps/3 Ph/86 Kw and 110V/50-60 cps/1 Ph/200 W.



AN/WRT-1 MF 500W RADIO TRANSMITTER

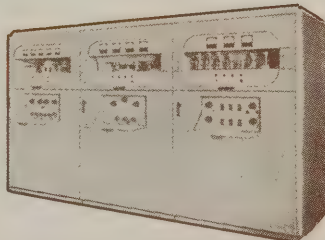
A 500 watt CW FSK and AM transmitter designed by Westinghouse for all types of shipboard installations. Covering frequency range of 300 to 1500 kHz. Power Input Requirements: 220 or 440 V/60 Hz/3 Ph.



AN/FRT-27 15KW HF TRANSMITTER

A high power Radio Transmitter manufactured by Collins Radio for the U.S. Navy. It provides reliable point to point communications over long distances. With some minor modifications in the Power Amplifier Circuit the AN/FRT-27 will act as a Power Amplifier for a low level SSB Transmitter.

Specifications: Frequency: 4-26 mc. • Preset Channels: 1. • Frequency Control: Master Oscillator or Crystal. • Carrier Output: A3A: 8 Kw., A3: 10 Kw, A1: 15 Kw, F1: 15 Kw, F4: 15 Kw. • Power Requirements: 220V/50-60 cps/3 Ph/35 Kw.



COLLINS 204F-1 2.5 KW HF LINEAR AMPLIFIER

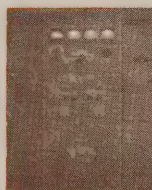
A very modern manually tuned RF power amplifier with dual channels which may be independently tuned. Switching between preset channels may be accomplished in less than one second.

Specifications: Frequency Range: 2 - 30 MHz. • Output Power: 2500 watts PEP. • Drive Power: 1 watt nominal. • Primary Power: 230 V/50 - 60 cps/1 Ph. • Dimensions: 20" W x 70" H x 20" D. • Weight: 575 lbs.



AN/FRT-17 HF 500W RADIO TRANSMITTER

Heavy duty transmitter was manufactured by I.T.T. for the U.S. Navy for use at shore stations. Frequency Range: 2 to 30 MHz • Emission: cw, mcw, am, fsk and fax • Frequency Control: Crystal 10 channels or VFO • Input Power: 115 or 230V/1 Ph/50-60 Hz, 3000W • Dimensions: 73 in H x 32 in. W x 27 in. D • Weight: 1500 lbs.



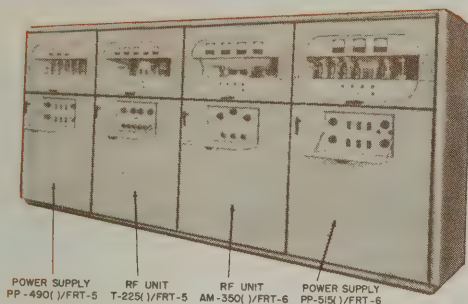
BC-610-E • BC-610H • BC-610I 400 W HF TRANSMITTER

A 2-18 mc High Power AM and CW Transmitter manufactured by the Hallicrafters Co. This Transmitter being the rugged military version of the famous Hallicrafter Model HT-4 the BC-610E is widely used for all types of services requiring an efficient, and reliable medium frequency rugged transmitter.

Specifications: Frequency Range: 2 - 18 mc • Channels: 3 • Output Power: 400 Watts CW, 300 Watts AM • Frequency Control: Crystal or Master OSC • Output Impedance: 73 ohm Balanced Line • Microphone: Carbon T-17, Dynamic-T-50 • Power Input: 115 VAC 50/60 cps 1 Phase, 2 kw • Circuit: Two 100th MOD, one 250th PA Class-C • Dimensions: 40" H x 22" D x 33" W • Weight: 400 lbs. • Principal Components: BC-610E Transmitter with PA Coils, Tuning Units and Cables, BC-939 Antenna Tuning Unit, BC-614-E Speech Amplifier. We can also supply BC-610-H and BC-610-I Transmitters.



HF TRANSMITTERS



AN/FRT-5 15 KW HF TRANSMITTER

A fixed station CW, FSK, or FAX Radio Transmitting set designed for Naval shore stations by Collins Radio. It is the same as the Collins type 205D-I. The AN/FRT-5 may be adapted to SSB by use of an SSB Generator.

Specifications: Freq. Range: 4 to 26 mc • Power output: 15 kw • Type signal: CW A1, FSK F1, FAX F-4 • Output Impedance: 600 ohms • Freq. control: crystal or Collins P.T.O. • Preset channels: 10 using Collins autotune • Keying speed: up to 400 wpm • Power requirements: 207-235 V, 60 cps, 3 phase, 4.25 kw.

AN/FRT-6 40 KW HF TRANSMITTER

The AN/FRT-6 consists of an AN/FRT-5 15 KW Transmitter which is used to drive the AM-350/FRT-6 RF Amplifier. This boosts the output of the AN/FRT-5 to 40 KW. The specifications of the AN/FRT-6 are the same as the AN/FRT-5 with the exception of the power output and inputs.



T-368/URT 400W HF TRANSMITTER

Designed for the Army to replace the famous BC-610 Series of transmitters and is part of the AN/GRC-26D Radio Set. It uses three rollout chassis to facilitate servicing. This unit may also be used as an exciter to drive high-power transmitters. It uses a very modern circuit employing a Collins type preamability tuned oscillator which is extremely stable. There are also provisions for an external oscillator as well as the MD-239/GR frequency shift

exciter. This transmitter uses a 4-400A tube as the power amplifier modulated by two 4-125A tubes. No plug-in coils are required. A vacuum variable capacitor is used in the RF amplifier circuit.

Specifications: Freq. Range: 1.5 to 20 mc • Type of Modulation: AM and narrow band FM • Type of Signal: CW, AM, MCW, (FSK with MD-239/GR) • Power Output: 450 W CW; 400 W AM • Power Input: 115 VAC 50/60 cps 1-phase 2200 W • Dimensions: 57" H x 32" W x 32" D • Weight: 700 lbs. Principal Components and Accessories: T-368/URT Radio Transmitter, MD-239/GR Frequency Shift Keyer, BC-939 or TN-339/GR Antenna Tuner.

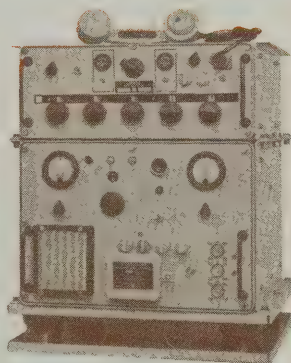


HF, SSB & ISB TRANSMITTERS

AN/URT-23(V) HF 1KW ISB & SSB TRANSMITTER

A very modern automatically tuned transmitter currently used aboard ships and at Naval shore stations. Consists of three basic units: the exciter, linear amplifier and choice of power supply for the linear. The T-827/URT exciter is also part of the AN/WRT-1 Radio Set.

Specifications: Frequency: 2 - 30 MHz in 100 Hz increments. • Modes: AM, CW, ISB, USB, LSB, FSK. • Power Output: 1 kw PEP or average. • Principle Components: T-827/URT Transmitter exciter, AM-3924(P)/URT RF Linear Amplifier PP-3916/URT 220 or 440V/60 Hz/3 Ph, MT-3399/U Shock Mounting.



TMC SBT-1K SSB & ISB 1KW HF TRANSMITTER

A general purpose transmitter covering a frequency range of 2-32 MHz, in 10 crystal-controlled channels, or continuous VFO coverage. Ideal for applications requiring a highly reliable sturdy transmitter for continuous duty service.

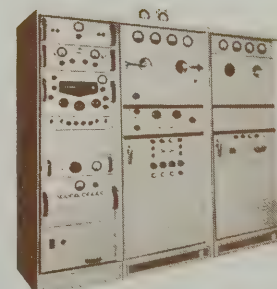
AN/WRT-2 HF 1000 W SSB RADIO TRANSMITTER

A 1000 W PEP or 500 W CW Naval shipboard radio transmitter designed by Westinghouse. Covers the frequency range of 2 to 30 MHz. An additional feature of the AN/WRT-2 is its ISB mode of operation. This transmitter, along with its automatic antenna coupler, will load into 35 ft long Naval whip antennas.



AN/FRT-51 HF 5 KW SSB ISB TRANSMITTER

A very modern transmitter designed for the U.S. Army by Collins Radio. Covers the frequency range of 1.5 - 30 MHz. Can be manually or remotely controlled. Ideal for communications systems requiring a versatile, heavy duty transmitter for continuous duty. This transmitter contains a frequency synthesizer with frequency indication presented on a veeder-root counter dial. Directly controlled from front panel of the exciter unit.



Please write for complete data.



HF, SSB & ISB TRANSMITTERS

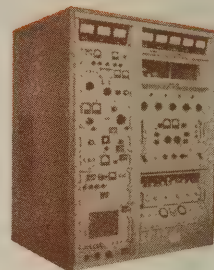
TMC MODEL GPT-750D 750 WATT SSB & ISB TRANSMITTER

The Technical Materiel Corp. Model GPT-750D military (AN/URT-17()) are known world wide for their dependability. The GPT-750 series feature continuous tuning from 2 - 32 mc and provide 750 watts PEP SSB, USB, ISB, 750 watts, high level AM and 1000 watts CW and FSK.



TECHNICAL MATERIEL CORP. GPT-10K 10 KW HF TRANSMITTER

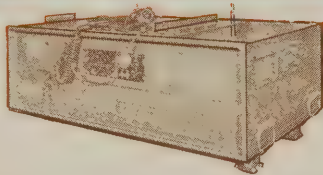
TMC model GPT-10K series are general purpose HF radio transmitters. Provide SSB, ISB, AM, CW, FSK, and FAX modes of operation from 2 to 20 MHz at 10,000 watts PEP and 5000 watts average power. These transmitters are widely used by the U.S. Government, as well as commercially. Columbia can supply most popular versions of these very dependable transmitters. Please write for more information.



HF, SSB & ISB RECEIVER—TRANSMITTERS

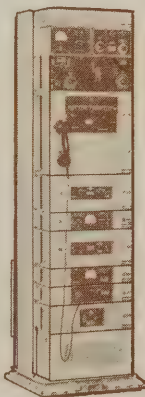
AN/TRC-75 HF 900 WATT SSB TRANSCIEVER

Designed for Vehicular, Fixed, Airborne or Shipboard installations. This set is widely used by the U.S. Marine Corps, and Navy, and was designed and manufactured by Collins Radio. It is splashproof in construction, and waterproof when covers are in place. Has a built-in automatic Antenna Tuner. **Specifications:** Frequency Range: 2 - 30 mc. in 28,000 automatically tuned channels 1 kc apart. • Power Output: 750 - 900 Watts PEP. • Operating Modes: USB, LSB, DSB, AM, CW, FSK, Tone. • Power Requirements: 115V/400 cps/3 Ph/2.5 Kw. • Size: 49" W x 20" H x 31" D. • Weight: 325 lbs. • Special Power Converters are available to convert 50-60 cps power to 3 Ph 400 cps as well as 28 VDC to 110V/3 Ph/400 cps.



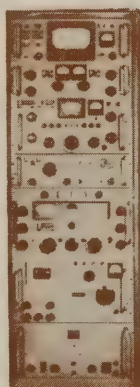
AN/URC-32 • COLLINS KWT-6 TYPE 8 HF 500W SSB & ISB TRANSCIEVER

Manufactured by Collins Radio, widely used by the U.S. Navy for shipboard and shore stations. It provides highly efficient and reliable radio communications over long distances. **Specifications:** Frequency Range: 2 - 30 mc in 1 kc increments. • Tuning: Manually 28,000 channels. • Output Power: 500 Watts PEP. • Modes of Operation: USB, LSB, DSB, AM, SW, FSK. • Power Requirements: 115 or 220V/50-60 cps/1 Ph/1400W. • Antenna Coupler: Either Manual or Automatic not part of AN/URC-32. AN/SRA-22 Automatic Antenna Coupler Available.



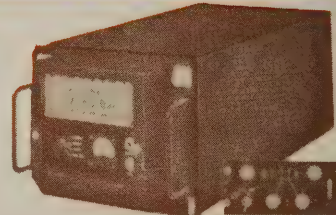
TMC MODEL SYM-1097 350 WATT SSB & ISB RADIO TRANSCIEVER

The Technical Materiel Corporation Model SYM-1097 SSB Radio Receiving-Sending Set was manufactured for the U.S. Navy. This model made up of standard TMC catalog items. **Specifications:** Frequency Range: Transmitter 2 to 32 mc. • Frequency Range: Receiver 550 kc to 31.5 mc. • RF Output: 350 watts PEP or 175 watts average. • Operating Modes: USB, LSB, ISB, AM, CW. • Frequency Control: Crystal 10 Channels or VFO. • Dimensions: 60" H x 20 1/2" W x 25" D. • This set is made up of the following TMC catalog items: 1 ea. ATS-2 Antenna Tuning System. • 1 ea. MCU-50 RF Monitor Control Unit. • 1 ea. SBE-2 Transmitter Exciter with Power Supply. • 1 ea. VOX-5 Variable Frequency Oscillator. • 1 ea. PAL-350 Linear RF Amplifier with Power Supply. • 1 ea. GPR-90RX Communications Receiver. • 1 ea. MSR-4 SSB Mode Receiving Adapter. • 1 ea. RAK-19 Cabinet for above equipment.



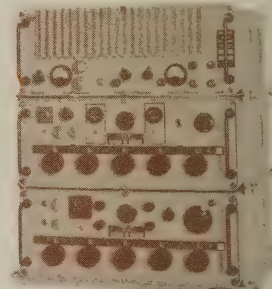
COLLINS RADIO 618T-1 • 618T-2 • 618T-3 400 WATT SSB TRANSCIEVERS

The Collins Radio 618T series is a compact H.F. SSB Transceiver ideally suited for aircraft, shipboard, ground or vehicular installations requiring medium power. The operating frequency is indicated directly on a digital type dial, on the remote control unit. A fully automatic antenna tuner is also available. All models are the same except for power requirements. **Specifications:** Frequency Range: 2 - 29,999 in 28,000 Preset Channels 1 kc apart. • Power Output: 400W PEP SSB, 100W AM and CW. • Type Emission: USB, LSB, AM, CW. • Power Requirements: 618T-1 and 516H-1 Power Supply (Optional) 27.5 VDC and 115V/400 cps/3 Ph. 618T-2 27.5 VDC and 115V/400 cps/3 Ph. 618-3 27.5 VDC and 115V/400 cps/1 Ph. • Write for complete specifications. In stock for prompt delivery: Specialized test equipment to facilitate servicing 618T Transceivers. Collins 678P-1 Bench Test Set, Collins 678Y-1 Module Extender Kit, Collins 678Z-1 Transceiver Function Test Box.



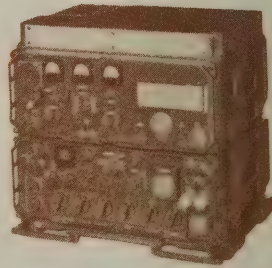
AN/WRC-1 100W HF SSB RADIO SET

A compact transmitter-receiver manufactured by General Dynamics Electronics for the U.S. Navy. This set is standard equipment on most U.S. Naval ships. **Specifications:** Frequency Range: 2 - 30 mc in 1 kc increments. • Frequency Stability: 1 part in 10⁷ per week. • Power Output: SSB-100W PEP; AM-25W. CW - 50W. • Modes of Operation AM, CW, FSK, USB, LSB, SSB. • Power Input: 115V/48 - 1000 cps/1 Ph.



AN/GRC-106 • AN/GRC-106A 400W SSB RADIO SET

A compact HF Radio Receiving Transmitting set designed by General Dynamics Electronics for the U.S. Army. This set is usually installed in vehicles. **Specifications:** Frequency Range: 2 - 30 mc in 1 kc increments. • Types of Operation: USM, LSB, AM, FSK, CW. • Power Output: SSB and AM-400 PEP CW and FSK 200W. • Power Requirements: 24 VDC at 1000W, AN/GRC-106A is a 280,000 channel version of the AN/GRC-106.





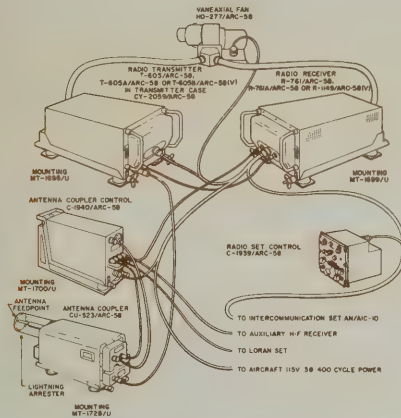
HF, SSB & ISB RECEIVER-TRANSMITTERS

AN/GRC-122 AND AN/GRC-142 HF 400W SSB AND TELETYPEWRITER RADIO SETS

These radio sets are installed in transportable shelters that can be carried by a M-37, 3/4-ton truck. The AN/GRC-122 is a full duplex system and the AN/GRC-142 is a simplex system. Both sets utilize the same major components. However, in order to function as a duplex system, the AN/GRC-122 utilizes a RT-662/GRC receiver as a monitor.



Specifications: Frequency Range: 2 - 30 MHz. • RF Output: 400 watt watts PEP. • Power Requirements: AC Operation 115V/60/1 Ph or DC operation 24VDC @ 90A. • Major Components: AN/GRC-106 Radio Set, MD-522A/GRC Teletype Modem, PP-4763/GRC AC to DC Power Supply, TT-98/FG Teletype Page Printer, TT-76A/GGC Teletype Repertor - Transmitter, RT-662/GRC Transceiver (AN/GRC-122 only). Most major components of these sets are described in various parts of this catalog.



COLLINS 618Z-3 • AN/ARC-58 1000W SSB RADIO SET

The AN/ARC-58 is an airborne radio set manufactured by Collins Radio to provide very reliable communications over very long distances between aircraft and ground stations and between other aircraft. Some of the major components of this system are also part of AN/TRC-75 and AN/URC-32 Radio Sets.

Specifications: Frequency Range: 2 to 29,999 mc in 28,000 channels, 1 kc apart. • Power Output: SSB 1000W PEP. • Power Requirements: 115V/400 cps/3 Ph. and 24 VDC.

AN/MRC-95 SSB RADIO SET

Radio Set AN/MRC-95 is a multi-purpose, single-sideband radio system operating in the USB, LSB, AM, CW, and FSK modes. It is composed of the Collins Vehicular HF System, VC-102, mounted in a jeep.

Specifications: Frequency range: 2.0 to 29,999 MHz. • Number of frequency channels: 28,000, spaced 1 kHz. • Operating modes: USB, LSB, AM, CW, FSK. • Frequency stability: 0.8 part per million per month. • We can supply a wide variety of items manufactured by Collins Radio Co. Tell us your needs.



AN/PRC-47 HF SSB 20W PORTABLE RADIO SET

A highly reliable portable HF transceiver designed for the U.S. Marine Corps by Collins Radio. It is particularly effective for use under the most adverse conditions.

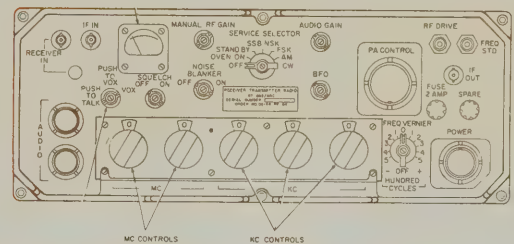
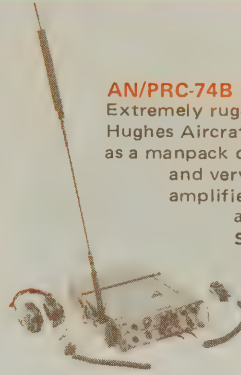
Specifications: 2.0 - 11,999 MHz in 10,000 channels, spaced 1 kHz apart. Transmitter power output: 20 watts PEP voice or 100 watts CW. • Power Requirements: 24 VDC or 115V, 1 Ph, 400 Hz.



AN/PRC-74B HF SSB PORTABLE TRANSCEIVER

Extremely rugged portable radio set designed by Hughes Aircraft Co. for the U.S. Army. May be used as a manpack or as a mobile unit. It is 100% solid-state and very reliable. A combination 100W linear amplifier and mobile power supply is also available as an optional accessory.

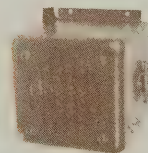
Specifications: Frequency Range: 2 to 18 MHz in 16,000 channels, 1 kHz apart. • Power Output: 15 watts all modes. • Modes of Operation: USB, AM and CW. • Power Requirements: 12 VDC (internal battery pack).



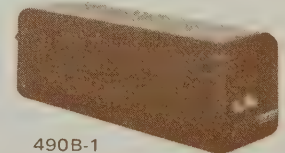
RT-662/GRC SSB HF RECEIVER-TRANSMITTER

This solid-state, digitally tuned, triple conversion transceiver was primarily designed by General Dynamics for the U.S. Army as part of the AN/GRC-106 Radio Set. However, it is also used in the AN/GRC-122 Radio Set as a separate monitoring Receiver. It may also be used as an exciter for an SSB Linear Amplifier, requiring low level excitation.

Specifications: Frequency Range: 2-29,999 MHz in 28,000 channels spaced 1 kc apart, or with vernier control to allow ± 500 Hz on any discrete frequency. • Emission Modes: USB, compatible am, cw, fsk. • Reception Modes: USB, compatible am, cw, fsk, dsb. • R-F Output: .1 watt PEP nominal. • Sensitivity: Less than .3 UV for 10 dB S/N. • Stability: 5×10^{-8} . • Bandwidth: 3.2 kHz. Primary Power: 27V DC $\pm 3\%$ @ 45 watts.



76F-1
Loudspeaker



490B-1
Antenna Coupler



718F-1
Transceiver



313V-1
Control



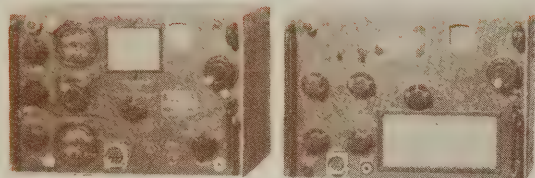
690D-1
Ant. Load Coil

COLLINS RADIO VC-102 HF 400W SSB RADIO SET

A multi-purpose SSB radio set designed to meet varied military tactical requirements. The basic transceiver used in the system is the 618T-3, which may be operated by a remote control unit located up to 100 ft from the transceiver. Nominal power output is 400 watts PEP in the SSB mode or 100 watts, in AM, CW or optional FSK. A choice of 28,000 channels, spaced 1 kHz apart is provided in the 2 - 29,999 MHz frequency range. Flexibility in antenna location is made possible by a separate automatically tuned antenna-coupler which may be located up to 100 ft from the transceiver case. Maximum input power requirements are 27.5 VDC at 53 Amps.



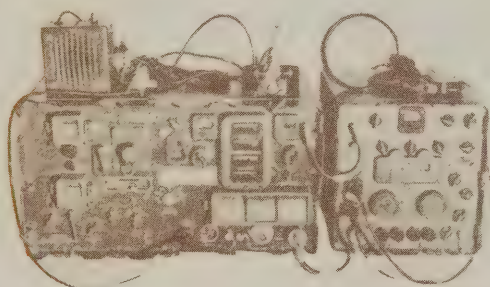
HF, AM & CW RECEIVER-TRANSMITTERS



NAVY MODEL TCS RADIO SET

A medium power AM and CW 1.5 to 12 mc transmitter and receiver designed by Collins Radio for shipboard as well as vehicular or fixed station use. This equipment is adaptable to a wide range of operating power inputs by use of the variety of power supplies available.

Specifications: Frequency Range: 1.5 - 12 mc • Frequency Control: Crystal or Manual • Preset Frequency 4 Transmitter 4 Receiver • Power Input: 75W CW or 50Q AM. Principal Components: TCS Receiver • TCS Transmitter • TCS Antenna Loading Coil • TCS Speaker - Remote Control Box. • Set of Cables, • TCS 12 VDC Dynamotor Power Supply • TCS 110 VAC Rectifier Power Supply • TCS 110 VDC Motor Generator Set • Crystals • TCS 12/24 VDC Dynamotor Power Supply • TCS 115/230 VAC Rectifier Power Supply.



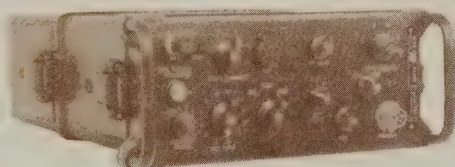
T-195/GRC-19

R-392/URR

AN/GRC-19 100 WATTS RADIO SETS

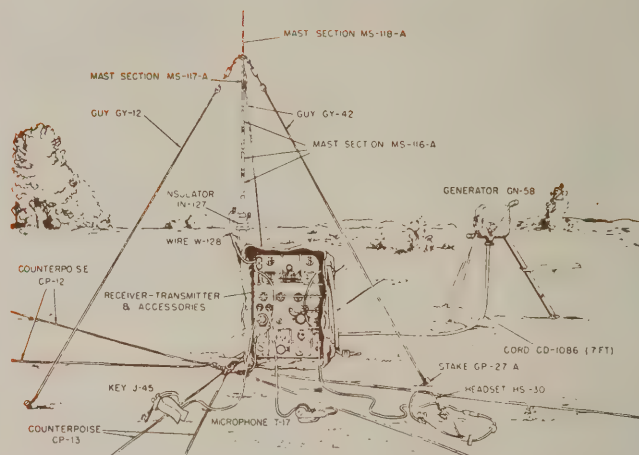
Radio Set AN/GRC-19 consists of Radio Transmitter T-195/GRC, Radio Receiver R-392/URR, a 15 ft whip antenna, necessary audio accessories and interconnecting power and control cables. This set is capable of radioteletype operation when used with associated equipment. The transmitter is automatically tuned.

Specifications: XMTR Power Output: 100W • Type of emission: AM, CW and RTT • Frequency Coverage Transmitter: 1.5 to 20 mc. • Frequency Coverage Receiver: .5 to 32 mc • Tuning: Continuous Tuning • Preset facilities (transmitter only); 7 • Power Source: 28 volts. Consists of R-392/URR Radio Receiver and T-195/GRC-19 Radio XMTR.



AN/TRC-77A HF RADIO SET

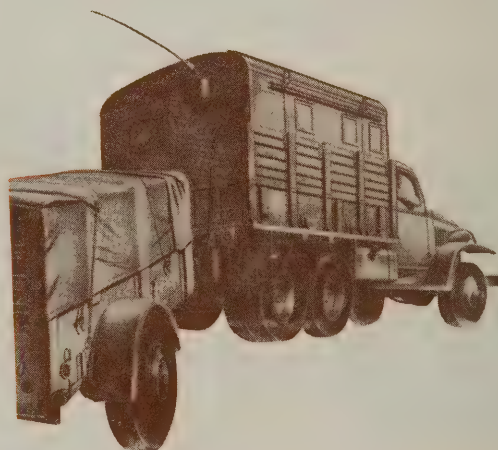
A six channel crystal controlled CW partially solid-state transceiver covering the frequency range of 3 — 8 MHz, intended for use as a portable field transceiver. It is powered by a self-contained 12V Nicad Battery Pack. The transmitter has a power output of 10 — 14 watts. This set supplied with accessories and is ready for field use. Total weight including battery: 27 lbs.



AN/GRC-9, 9A, 9X, 9Y 87 & AN/VRC-34 RADIO SETS

A light-weight, man-transportable field radio set, providing two-way radio communications in the HF range. This set is also provided with mounting and power supply of vehicular service.

Specifications: Frequency Range: 2 - 12 mc in three bands • Type Modulation: AM, CW, or MCW • Frequency Control: MO or crystal • Power Source: 6, 12 or 24 VDC or hand powered generator • Power Output: 7 watts AM 15 watts CW. Principal Components: RT-77/GRC-9 Transceiver • PE-237 6, 12, 24 VDC Vibrator Power Unit • GN-58 Hand Powered Generator • CD-1086 Power Cable • G-43/G Hand Powered Generator Replaces GN-58 • DY-105/GRC-9X Power Supply 24 VDC Input • DY-88/GRC-9 Power Supply 6, 12, 24 VDC Input • PP-327/GRC-9Y Rectifier Power Supply 115/220 VAC Input 50/60 cps.



SCR-399 & AN/GRC-26, A, B, C, D, 400W HF RADIO SETS

Radio Set AN/GRC-26 is a mobile self-contained radio teletypewriter, voice-CW communications center which can be operated in motion or stationary. The principal components are: BC-610 Radio Transmitter - 2 - 18 mc - 400W, R-388/URR Radio Receivers .5 - 30.5, PE-95 Power Plant. Radio Set SCR-399 basically the same as AN/GRC-26 but does not have provisions for radio teletype. Also uses BC-342 radio receivers 1.5 to 18 mc.

AN/GRC-41 HF 400 WATT RADIO SET

Same as AN/GRC-26D but less teletype provisions. Utilizes two R-390/URR receivers and one T-368/URT 400W radio transmitter.



VHF FM RECEIVER-TRANSMITTERS & ACCESSORIES



RT-524/VRC

R-422/VRC

AN/VRC-12 • AN/VRC-43 THRU -49 FM RADIO SETS

The AN/VRC-12 and AN/VRC-43 thru -49 Radio Sets were designed for the U.S. Army to replace the AN/GRC-3 to 8 and AN/VRC-8 to 10 Radio Sets. This equipment uses the latest solid state design techniques. All equipment is 100% solid-state except that the transmitter section uses one electron tube as the RF power amplifier. The various systems differ by the type and quantity of components supplied.

Specifications: Frequency Range: 30 - 75.95 mc in two bands.

- Number of Manual Channels: 920 each 50 kc apart.
- Preset Channels: 10 each RT-246/VRC (only).
- Transmitter Power Output: 35 watts or 3 watts.
- Power Input: 24 VDC at 10 amps.
- Major Components: RT-246/VRC Receiver Transmitter • RT-524/VRC Receiver Transmitter • R-442/VRC Radio Receiver • AS-1729/VRC Antenna matching unit and Antenna • AN/VRM-1 Special Test Set for AN/VRC-12, etc.
- All AN/VRC-12 Accessories and Spare Parts are available from Columbia.
- Write for quotations.



T-14/TRC-1 FM RADIO TRANSMITTER

A single-channel ground transportable Transmitter set intended for point to point communications.

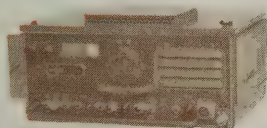
Specifications: Frequency Range: 70 - 100 mc • Preset Frequency: One • Type Modulation: FM •

Frequency Control: Crystal Power Output: 50 watts • Power Source: 115 VAC 60 cps; 1 Ph. • Size: 11" x 20" x 13" • Weight: 66 lbs.

T-14J/TRC-1 and T-14I/TRC-1 wide band pass models also in stock.

AN/TRA-1 250W RF AMPLIFIER

Designed to boost the output of the T-14/TRC-1 to 250 watts output.

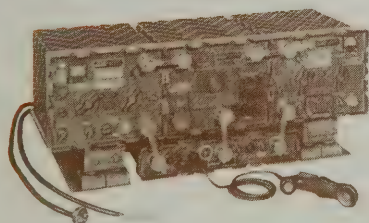


R-19/TRC-1 FM RECEIVER

A single channel ground transportable set, intended for point-to-point communications.

Specifications: Frequency Range: 70-100 mc • Preset Frequency: One • Type Modulation: FM • Frequency Control: Crystal • Power Source: 115 VAC 60 cps; 1 Phase • Size: 8" v 20" x 13" • Weight: 45 lbs.

R-19J/TRC-1 Bandpass Receivers, also in stock.



AN/GRC-10 FM RADIO SET

A VHF FM Receiving and Transmitting Set that can be used in single-channel push to talk communications applications, or as a terminal station of a single-channel or multi-channel line of sight radio relay system.

Specifications: Frequency Range: 54 to 70.9 mc. • Manual Channels: 170 each spaced 100 kc apart. • Transmitter RF Output: 10W or 40W. • Power Requirements: 24 VDC or 115 or 230V/50 - 65 cps/1 Ph. • Major Components: R-125/GRC-10 Radio Receiver. • T-235/GRC-10 Radio Transmitter. • DY-94/GRC-10 Dynamotor-AC Power Supply. • C-632/GRC-10 Control Box.



AN/PRC-77 FM RADIO SET

The latest, fully transistorized portable FM transceiver in current use by the U.S. Army. This rugged lightweight unit also forms part of the AN/GRC-160 and AN/VRC-64 vehicular radio sets and is fully compatible with the AN/VRC-12 and other similar radio sets.

Specifications: Frequency range: 30 - 75.95 MHz. • Preset

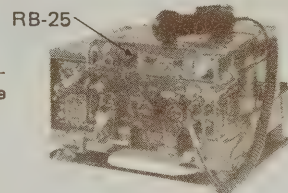
Channels: 920 each 50 kHz apart. • Transmitter Output: 2 watts. • Power Requirement: Dry battery or nickel cadmium rechargeable battery. • Weight: Approximately 20 lbs.

AN/PRC-25 FM RADIO SET

This is the predecessor to the AN/PRC-77 radio set (above). It has the same principal specifications as the AN/PRC-77 except that it has one electron tube in the transmitter output circuit.

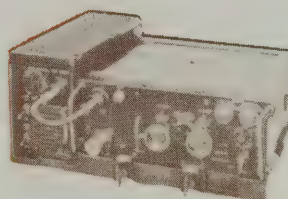
AN/VRC-64 • AN/VRC-53 FM RADIO SETS

A vehicular radio set utilizing the RT-841/PRC-77 radio transceiver and the OA-3633/GRC Audio Amplifier Power Supply which provides operating voltages to the transceiver and serves as an audio amplifier for the received signal. Also included are mounting base, antenna and accessories. This set succeeds the AN/VRC-53 by replacing the RT-505/PRC-25 with the fully transistorized RT-841/PRC-77. Same specifications for AN/PRC-77. This set is ideal for installations not requiring higher RF power. If additional RF output is required, the RB-25 RF amplifier can be added to the AN/VRC-64 or AN/VRC-53 to increase the transmitter output to 30 watts RF. AN/GRC-125 and -160 Radio Sets also available.



RB-25 RANGE BOOSTER RF AMPLIFIER

A solid-state 30 watt automatically tuned RF amplifier that may be added to the AN/PRC-25, AN/PRC-77 or AN/VRC-64 Radio Sets to increase the transmitter output to the general level of the AN/VRC-12. The RB-25 is fastened to the transceiver to form an economical high power system for either manpack or vehicular use.



OA-3633/GRC AUDIO AMPLIFIER POWER SUPPLY FOR AN/PRC-25 & 77 RADIO SETS

The AN/PRC-25 or -77 Radio Sets are adaptable for vehicular use when using the OA-3633/GRC which provides a mounting base for them. It also provides audio amplification for the audio output of the AN/PRC-25

or -77 to operate the loudspeaker which is part of the OA-3633/GRC.

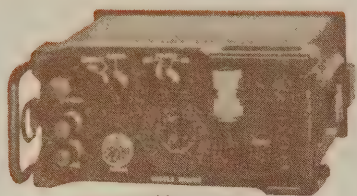
The OA-3633/GRC is also part of the AN/VRC-53, -64, and AN/GRC-125, -160 Radio Sets.

ACCESSORIES AND SPARE PARTS

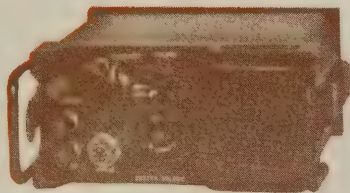
We can supply replacement parts, spares and accessories for all types of military electronic equipment. Tell us your needs.



VHF FM RECEIVER-TRANSMITTERS & ACCESSORIES



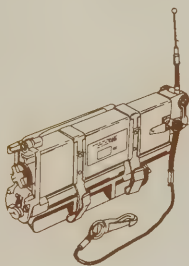
C-2329/GRA-39



C-2328/GRA-39

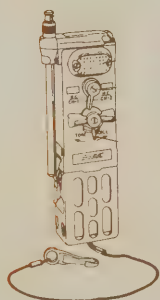
AN/GRA-39 RADIO SET REMOTE CONTROL GROUPS

The AN/GRA-39 adapts the AN/PRC-25, 77, AN/VRC-12 and AN/VRC-43 to 49 Radio Sets to allow remote control of these sets from a distance of up to two miles away.



AN/PRR-9 FM RECEIVER

A subminiature, FM, single-channel, crystal controlled receiver covering the frequency range of 47 - 57 MHz. This very light solid-state unit is designed to be attached to a standard military combat helmet or carried in a shirt pocket.



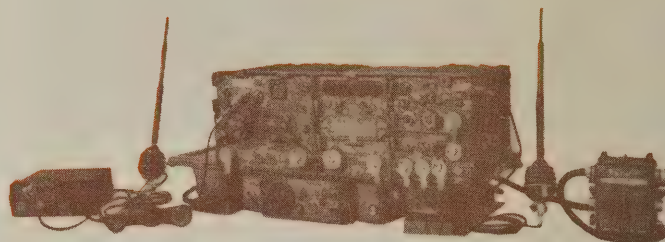
AN/PRT-4A FM TRANSMITTER

A hand-held, solid-state, FM, dual-channel 47 - 57 MHz crystal controlled transmitter with a maximum output of 450 mw. This unit has a built-in microphone and is designed to be used in conjunction with the AN/PRR-9 FM Radio Receiver described above.

AN/PRC-6 FM HANDY-TALKIE

Lightweight handy-talkie which was designed to provide communications over short distances.

Specifications: Frequency Range: 47 - 55.4 mc
• Channels: One, Crystal Controlled • Power Output: .25W • Power Source: BA-270/U Dry Battery • Weight: 7 lbs.

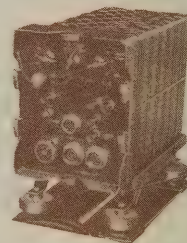


AN/GRC-3, 4, 5, 6, 7 & 8 FM RADIO SETS, AN/VRC-8, 9 & 10 RADIO SETS

The radio sets AN/GRC-3 through 8 series consists of a system of radio sets identical in all respects except for frequency. Major components: RT-66/GRC Transceiver, 20-27.9 mc • RT-67/GRC Transceiver, 27-38.9 mc • RT-68/GRC Transceiver, 38-54.9 mc • RT-70/GRC Transceiver, 47-58.4 mc • R-108/GRC Receiver, 20-27.9 mc • R-109/GRC Receiver, 27-38.9 mc • R-110/GRC Receiver, 38-54.9 mc • PP-109/GR Power Supply 12 VDC • PP-112/GR Power Supply 24 VDC • AM-65/GRC Amplifier.

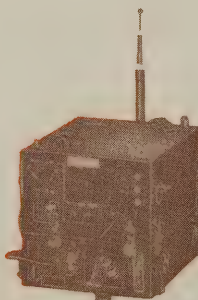
AN/GSA-7 RADIO SET CONTROL

A small lightweight electronic switching device for use in integrated wire-radio systems. Also used to interconnect radio transceivers, transmitters and receivers with local battery telephone equipment on a push-to-talk basis. This equipment can be used with almost all commonly used Army radio sets. Power input: 24 VDC or 115 or 230V/50 - 400 Hz/ 1 Ph.



AN/TRC-20 FM RADIO SET

A modified SCR-609 or SCR-610 Radio Set designed to be used with the GR-8 artillery sound ranging set. Frequency range: 27 - 38.9 MHz. Transmitter RF power output: 1.3 w. Power Input: 6, 12 or 24 V DC.



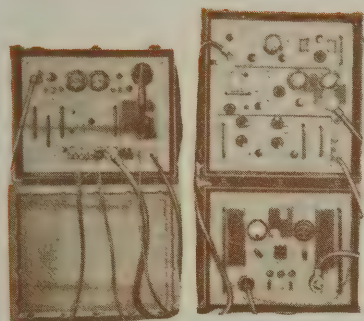
FLEXIBILITY

Electronics is a business of thousands of items in all types of conditions. No supplier warehouses all of them. What we have, we ship out quickly — often, the same day on which the order is received. What we do not have, we procure. What may be broken, marred or defective — we repair. If we don't have it, can't find it, or if unable to repair it, Columbia will manufacture the item to order if the need is important enough.

Need something special in electronics? Call Columbia — the can-do company.



VHF & UHF FM RECEIVER— TRANSMITTERS & ACCESSORIES



AN/TRC-24, 35, 36 • AN/ GRC-75, 76, 78, 79, 80, 82, 83 • AN/TRA-25 FM RADIO SET GROUPS

These radio set groups, designed by Western Electric Co. for the U.S. Army, are various combinations of the original AN/TRC-24. This equipment uses the T-302/TRC Transmitter and R-417/TRC Receiver. The frequency of the transmitter and receiver is determined by

plug-in RF tuning units. This equipment is used for point-to-point radio relay systems, and will provide 12 multiplex carrier channels. **Specifications:** Frequency: A-Band 50 - 100 mc, B-Band 100 - 225 mc, C-Band 225 - 400 mc, D-Band 400 - 600 mc, F-Band 790 - 925 mc. • Transmitter Type: FM (Crystal Controlled AFC Circuit). • Transmitter Output: 50 - 120W. • Type of Transmission: Voice and multi-channel carrier (12). • Receiver Type: Superheterodyne. • Power Requirements: 115/50 - 60 cps/1 Ph. Major Components: T-302/TRC Transmitter. • R-417/TRC Receiver. • PP-685/TRC Power Supply for Transmitter. • Plug-in RF amplifiers.

AN/GRC-103(V) • FM RADIO SET

A very modern transportable radio relay set designed by the Canadian Marconi Co. for the U.S. Army. Provides facilities for multi-channel radio communications of pulse code modulation signals, by the use of plug-in tuners. This set can cover the frequency range of 220 to 1000 MHz. Will accommodate up to 24 voice channels when used with appropriate multiplex equipment.

MK-456A/GRC RE-TRANSMISSION CABLE KIT

This kit is used to connect two compatible FM radio sets such as AN/PRC-77 or AN/VRC-12 together for re-transmission. Consists of a special purpose cable assembly type CX-4656A/GRC fifty feet long, and a canvas bag for storing it.

IMPORTANT NOTICE

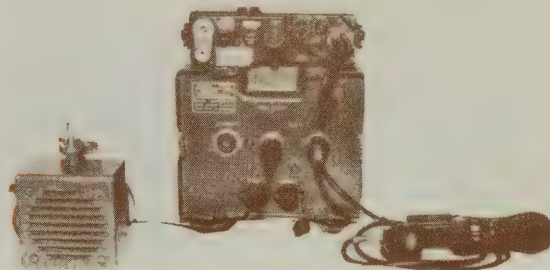
Due to space limitations it was not possible to supply the complete technical specifications for many items. We will supply upon request complete specifications on any equipment of interest found in this catalog.



AN/PRC-8, -8A, -9, -9A, -10, -10A RADIO SET

Lightweight, low power battery operated FM radio receiver-transmitters intended for short range portable communications. All three models are identical except for frequency coverage.

Specifications: AN/PRC-8, 8A 20 - 27.9 mc • AN/PRC-9, 9A 27 - 38.9 mc • AN/PRC-10, 10A 38 - 54.9 mc. • Tuning: Continuous tuning. • Frequency Control: MO • Power Output: .9 watts • Power Source: BA-279/U Dry Battery • Weight: 22 lbs.



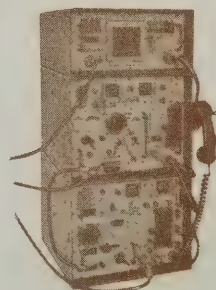
AM-598/U AMPLIFIER POWER SUPPLY FOR AN/PRC-8, 8A, 9, 9A, 10 & 10A RADIO SETS

For vehicular operation of Radio Set AN/PRC-8, -9, and -10, the set can be installed in a vehicle which has a 24 volt electrical system by using the Amplifier Power Supply AM-598/U. The AM-598/U provides two audio connectors to which a loudspeaker and a handset or microphone may be connected.

AN/GRC-50(V) FM RADIO SET

A portable radio set designed by RCA to provide for multichannel line-of-sight communications. This set is intended primarily for use as a radio link in a communications network which may include carrier telephone and teletypewriter sets. The radio set may be used with 4-, 12- or 24-channel frequency division multiplex, or 12- or 24-channel pulse code modulation equipment.

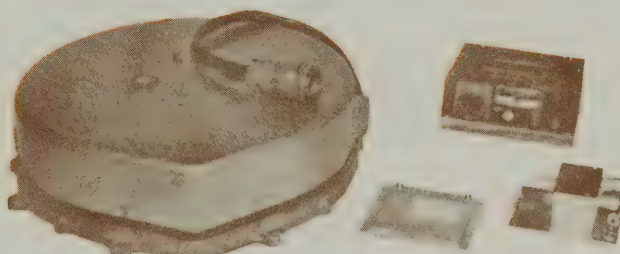
Specifications: Frequency Range 601.5 - 999.5 MHz, or 1350 - 1849 MHz • RF Power Output: 8 - 30 watts depending on frequency • Power Input: 115/47-63/1 Ph.



DIRECTION FINDING EQUIPMENT

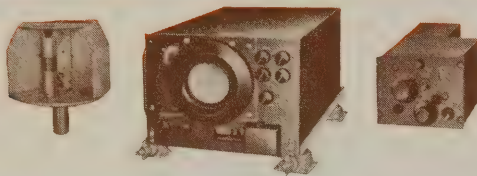
AN/ARA-25A • AN/ARA-25 UHF DIRECTION FINDER GROUP

Employed to home on and to indicate the relative bearings of UHF radio signals received within the frequency of 225 - 400 mc. This equipment is used with the following UHF radio sets: AN/ARC-27, AN/ARC-34, AN/ARC-52 and many others. Principal Components: AM-608/ARA-25 Electronic Control Amp • MT-1043/ARA-25 Mounting Base for AM-608/ARA-25 • AS-578/ARA-25 Antenna • RE-120/ARA-25 Antenna Relay • MT-1042/ARA-25 Mounting for Antenna Relay • ID-90/ARN-6 Bearing Indicator. • AN/ARA-25A uses AM-1777/ARA-25A miniature amplifier.



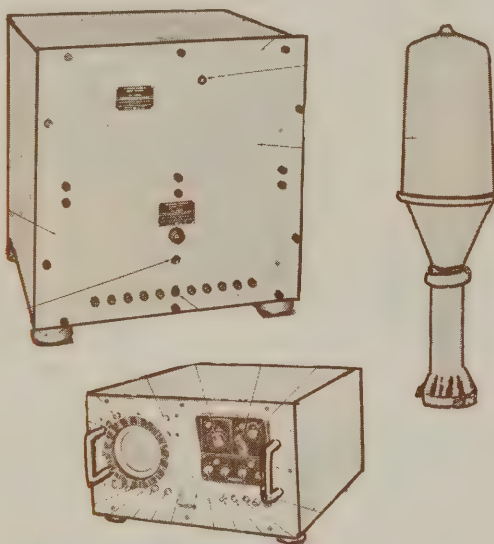


DIRECTION FINDING EQUIPMENT



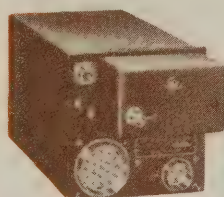
AN/APA-69 DIRECTION FINDER GROUP

This group of rotatable antennas and azimuth indicators can be used with any receiving set covering the frequency range of 180 to 10,750 MHz. Normally they are used with the AN/APR-9, AN/APR-13 or AN/ALR-8 countermeasures receiving sets. Power input — 115VAC/1PH/400HZ.



AN/URD-4 UHF DIRECTION FINDING SET

The AN/URD-4 was designed by Bendix Radio for the U.S. Navy. It is intended for shipboard installation or shore station use. **Specifications:** Frequency Range: 225 - 399.9 mc in 1750 channels 100 kc apart. • Preset Channels: 19. • Requirements: 115V/55 - 60 cps/1 Ph.



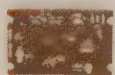
R-30A
Receiver
Part No. 20480



DV-14A
Dynaverter
Part No. 24630



L-11 Loop
Part No. 18000



C-59A
Control Unit
Part No. 20500



IN-12-1
Single Indicator
Part No. 17310

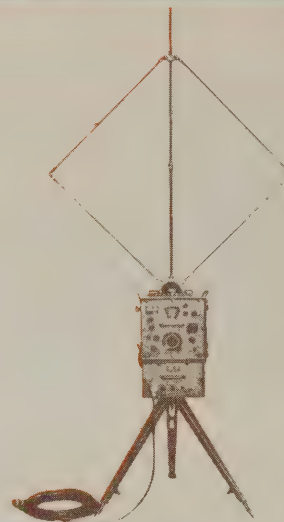


IN-13A-1
Dual Indicator
Part No. 27470

AN/ARN-59 AIRCRAFT RADIO CORP. TYPE 21 ADF SYSTEM

The ARC type 21 and AN/ARN-59 are compact highly reliable light-weight automatic radio direction finding sets widely used in small aircraft and helicopters. The loop antenna is a low silhouette pancake type.

Specifications: Frequency Range: 190 - 1750 kc in 4 Bands. • Type of Reception: CW, AM, MCW. • Power Input: AN/ARN-59 24 VDC, type 21A 24 VDC. System Weight: Approximately 20 lbs.



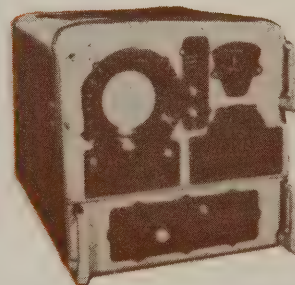
AN/PRD-1 DIRECTION FINDER SET

The AN/PRD-1 is a portable or vehicular-mounted direction finder set designed for the U.S. Army. Bearings are obtained by the Aural-Null method of determination. The accuracy of the bearing is approximately one degree, depending upon the skill of the operator.

Specifications: Frequency: 100 kc to 30,000 kc in 7 bands. • Type of Reception: A1, A2, A3, F3. • Type of Receiver: Superheterodyne. • Power Requirements: Dry Batteries 1.5V, 6V, and 90V or Dynamotor 24 VDC input.

AT-784/PRC DF LOOP ANTENNA

A hand-held loop antenna when used with the AN/PRC-25, -77 and AN/VRC-12 series radio sets or their equivalents. Comprises a homing device that enables the operator to find the direction of signals within the range of 30 - 76 MHz.



Receiver



Antenna

AN/SRD-7 DIRECTION FINDER SET

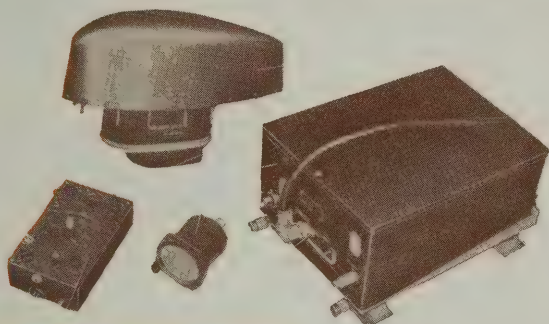
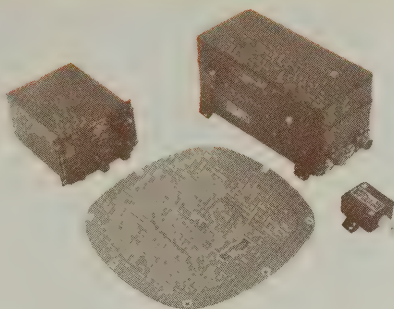
The AN/SRD-7 is a shipboard direction finding set manufactured by Stewart Warner Electronics for the U.S. Navy. This set can also function as a Panoramic Spectrum Analyzer. Frequency Range: 250 kc to 32 mc in 7 Bands. Panoramic Sweep Range: 50 kc each side of signal being received. Power Input: 115V/60 cps/1 Ph.



DIRECTION FINDING EQUIPMENT

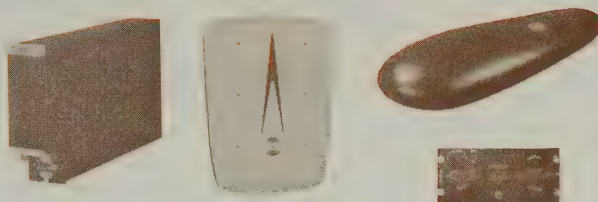
AN/ARN-89 RADIO COMPASS SET

The latest military ADF currently being installed in Army aircraft. This solid-state unit covers the frequency range of 100 - 3000 kHz and can provide automatic or manual compass bearings. Power input requirements: 27.5 VDC at 1.5 amps.



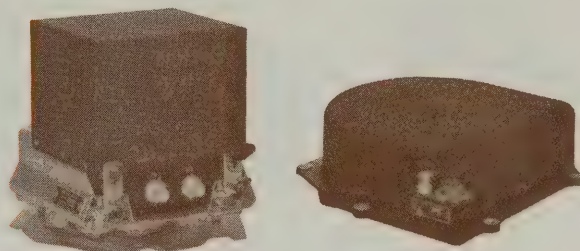
AN/ARN-6 RADIO COMPASS SET

A 16 Tube Radio DF Receiver covers the range of 100 to 1750 kc in four bands. This equipment was designed by Bendix Radio to replace the earlier airborne radio compass such as the SCR-269-G and AN/ARN-7. This equipment is lighter and more compact, having a hermetically sealed loop antenna. The AN/ARN-6 is ideal for aircraft and marine applications requiring a compact rugged and reliable set. This receiver has a built-in vibrator power supply. The power input is 24 VDC at 4 amps. Principal Components: R-101/ARN-6 Radio Compass • MT-274/ARN-6 Mounting Rack • AS-313/ARN-6 Loop Antenna • CW-141/ARN Loop Antenna Cover and Bracket • Loop Transmission Cable (6 ft) • C-149/ARN-6 Control Box • MT-275/ARN-6 Control Box Mounting Plate • ID-90/ARN-6 Azimuth Indicator • Set of Connectors • Flexible Tuning Shaft.



COLLINS DF-203 • AN/ARN-83 AIRBORNE DIRECTION FINDER

A solid-state, airborne automatic direction finder widely used aboard military and civilian aircraft. Covers the frequency range of 190 - 1750 kHz in three ranges. This set uses a fixed, non-rotating loop antenna.

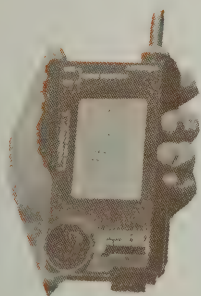


AN/ARA-50 UHF DIRECTION FINDER GROUP

An airborne direction finder which operates in the uhf range. Bearings may be taken from an aircraft equipped with the AN/ARA-50 to any transmitter operating in the 225- to 400-MHz range. Relative bearing information is displayed on a single panel instrument. The AN/ARA-50 may be used for course navigation, search and rescue operations, or for determining the relative direction of other aircraft. It will operate with Radio Sets AN/ARC-27, AN/ARC-34, AN/ARC-52, AN/ARC-51, AN/ARC-109, AN/ARR-40, and other equivalent uhf Radios. Principal components: AS-909/ARA-48 Antenna, AM-3624/ARA-50 Amplifier, MT-1955/ARA-50 Mount.



SURVIVAL EQUIPMENT



ACR MODEL RT-60B POCKET VHF & UHF TRANSCEIVER

Built and designed for U.S. Navy and Air Force pilots, this emergency locator transmitter features voice capability. Receives and transmits distress calls as well as transmits a warbling tone emergency signal. Snap-in/snap-out mercury battery provides over 22 hours continuous service for an emission range of hundreds of miles. Modular construction fits snugly into a rugged, one piece cast aluminum case for maintenance simplicity. Frequency

selector switch gives the operator a choice between 121.5 MHz and 243.0 MHz. Waterproof and shock resistant, this transceiver is tough enough to go into any environment. Meets military specifications.

ACR MODEL RLB-101 VHF & UHF EMERGENCY LOCATOR TRANSMITTER

Compact, 24-ounce emergency locator transmitter combines the most sophisticated electronic package with the most revolutionary battery around. A powerful Lithium battery provides 100 milliwatts per channel continuously for over 48 hours. Transmitting on 121.5 and 243.0 MHz, simultaneously, the ACR/RLB-101 solid-state transmitter sends warbling tone distress signals hundreds of miles. Tough plastic case and potted electronics assure watertight and shock resistant qualities. Battery storage life is 10 years (recommended 5 year check). Will operate at temperatures down to -40°F. Tested and approved under TSO-C91 and FCC Part 87.



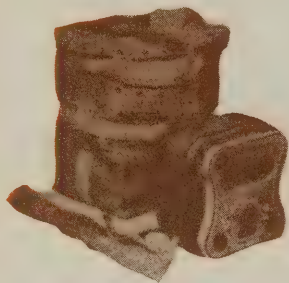


SURVIVAL EQUIPMENT

AN/PRT-5 EMERGENCY RADIO TRANSMITTER

A battery operated, solid-state dual-frequency emergency beacon transmitter usually carried aboard aircraft or packed in liferafts.

Specifications: Frequency: 8364 MHz and 243 MHz simultaneously. • Power Output: 500 mw for 72 hours, 250 mw for 48 hours. • Dimensions: 6" diameter x 16" Long. • Net Weight: 15 lbs.



AN/CRT-3 TRANSMITTER

A rugged emergency transmitter carried in aircraft but designed for operation from land or rubber life rafts after being dropped by parachute. This set automatically sends s-o-s signals on 500 kc or 8364 kc. All electrical power is furnished by a hand-power generator inside transmitter cabinet. This equipment requires no special skill to operate.



AN/PRC-49 UHF TRANSCEIVER

Manufactured for the U.S. Navy by Telephonics Corp. This set employs a 100% solid-state circuit using the latest in design techniques. This set is carried by Navy pilots.

Specifications: Frequency Range: 240 to 246 mc (preset at 243 mc). • RF Output: 100 MW, CW. • Frequency Control: Crystal. • Major Components: AN/PRC-49 Radio Set. • Mercury Battery Type 303214.



ACR MODEL RLB-5A FLOATABLE EMERGENCY LOCATOR TRANSMITTER

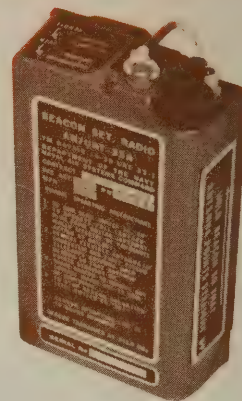
Opens new dimensions to air/sea rescue. Manually-activated or water-activated contacts trigger a powerful 250 milliwatt transmitter to send distress signals hundreds of miles. Transmits simultaneously on 121.5 and 243.0 MHz. Operational life exceeds 48 hours. Magnesium battery can be stored up to five years. Water-tight and shockproof styrofoam housing protects electronic components from rough handling and turbulent seas. Specially designed for lifeboats, rafts, aircraft, yachts and small boats. FAA approved under TSO-C91 and FCC Part 87.

ACCESSORIES AND SPARE PARTS

We can supply replacement parts, spares and accessories for all types of military electronic equipment. Tell us your needs.

AN/URT-33A UHF RADIO BEACON TRANSMITTER

A solid-state transmitter operating on 243 MHz. Powered from a self-contained Mercury battery. This set has a power output of 200 mw. This lightweight unit is packed in the parachute pack. When the parachute opens this set is automatically turned on. This unit has a flexible wire antenna as well as a telescoping antenna for use on the ground. This transmitter emits a variable frequency modulated tone. This beacon has a 15 hour minimum life span. Total weight 17 oz. including battery size: 2-1/2 in. x 4-1/2 in. x 1-1/4 in.



ACR RT-10 • AN/URC-10 UHF TRANSCEIVER

A lightweight very compact solid-state, hand held transceiver primarily designed for rescue operations. It transmits voice or a tone beacon on any frequency between 240 - 260 mc with selected crystal. Usually supplied set for 243 mc. This set uses 18 transistors. The receiver is a superheterodyne type. This set is 100% solid state. Major Components: RT-278/URC-10 Transceiver. • ACR Type RT-10 same as AN/URC-10 but has internal battery.

AN/PRC-90 UHF EMERGENCY RADIO SET

Latest solid-state hand-held dual-channel rescue transceiver currently in use. Employs integrated circuits and is extremely reliable. **Specifications:** Frequency Range: 242 - 245 MHz and 281 - 284 MHz. • Preset Channels: 2 each (one in each frequency range). • Modes: AM, voice and MCW. • Power Output: 400 - 500 MW. • Battery: Internal Mercury. Weight: 1.6 lbs.

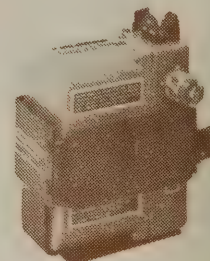


LARAGO MODEL LEFT 1005-AP EMERGENCY LOCATOR TRANSMITTER

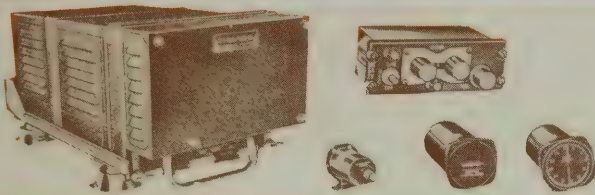
A high quality device which automatically transmits when subjected to impact. The Beacon will not transmit when subjected to unusual conditions such as rough air, hard landings and taxiing over rough terrain. The LEFT 1005 has quick disconnect and flexible mounting, 3 year battery shelf life, 12-month warranty; and emits 400 milliwatts effective power under normal conditions.

LARAGO MODEL LEFT 1005-AF EMERGENCY LOCATOR TRANSMITTER

Authorized under FAA TSO C91 for fixed aircraft mounting and FCC type accepted under Part 87. Manufacturing and Quality Control in accordance with applicable military and FAA specifications. Remote control including R.F. indicator light. Allows complete operation of ELT from cockpit, impact switch reset and manual operation. Internal telescoping antenna (portability). External aircraft antenna (2 types) with coax cable. Write for complete Larago catalog.

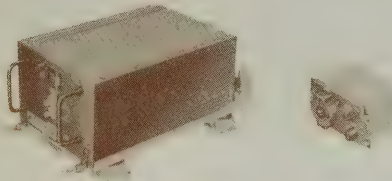


AIRCRAFT NAVIGATION EQUIPMENT



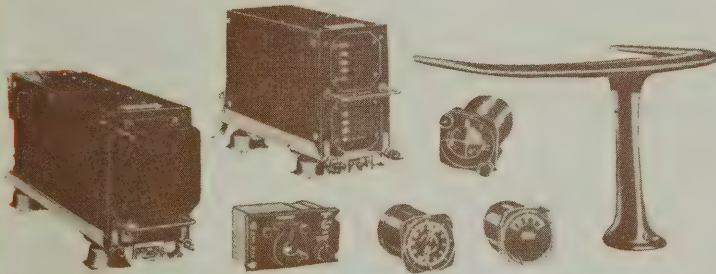
AN/ARN-21, -21B, -21C TACAN NAVIGATION SET

An airborne navigation interrogator-transponder designed to operate in conjunction with a surface navigation beacon transponder. This equipment enables aircraft to obtain continuous indications of its distance, and bearing from any selected beacon station located within a line-of-sight distance from the aircraft up to 195 nautical miles. Principal Components: RT-220/ARN-21 Radio Receiver Transmitter • MT-928/ARN-21 Mounting • C-866/ARN-21 Radio Set Control • ID-307/ARN Azimuth Indicator • CV-279/ARN Phase Detecting Network • ID-310/ARN Range Indicator



AN/ARN-52(V) TACAN NAVIGATION SET

One of the most advanced TACAN navigational sets in current use. Can be used for air-to-ground navigation or air-to-air ranging. Can be supplied in several configurations, depending upon aircraft space requirements. Please write for quotations as most configurations are available from stock for prompt delivery. Other TACAN sets also available: AN/ARN-65(V) • AN/ARN-84 • AN/ARN-103 • AN/ARN-105.



AN/ARN-14C • COLLINS 51R-3 NAV/COM RECEIVER SYSTEM

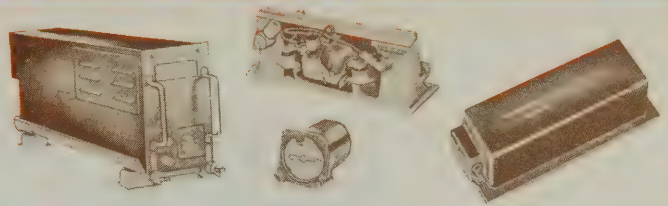
The Collins 51R-3 provides 280 crystal controlled receiving channels with 100 kc spacing between 108.0 and 135.9 mc. Receives all VOR/LOC and communications frequencies. This set is widely used by airlines the world over. The military version of the 51R-3 is the R-540/ARN-14C. Power Input 24 VDC. Principal Components: 51R-3 Collins VOR Receiver • R-540/ARN-14C Military Version • DY-66A/ARN-14C Dynamotor • C-760/A Control Panel • ID-249A/ARN Omni Mag. Ind. • ID-250/ARN Course Ind. • ID-251/ARN Radio Ind. Control • MT-627A/ARN-14 Receiver Mtg. • MT-628/ARN-14 Dynamotor Mount • AT-172/ARN-14 Antenna.

AN/ARN-14D • BENDIX NA-3A VHF NAVIGATION SYSTEM

The MN-85F VOR system is the Bendix equivalent of the Collins 51R-3. This system provides 280 crystal controlled receiving channels with 100 kc spacing between 108.0 and 135.9 mc. The military equivalent to the MN-85-F system is the AN/ARN-14-D. Power Input: 24 VDC. Principal Components: MN-85-F Bendix VOR Receiver. • R-541/ARN-14D Military Version • DY-66/ARN-14 Dynamotor • DY-84/ARN-14A Dynamotor • C-760A/A Control Panel • ID-249A/ARN OMNI Magnetic Indicator • ID-250/ARN OMNI Magnetic Indicator • ID-251/ARN Radio Indicator Control • MT-627A/ARN-14 Rec. Mtg. • MT-628/ARN-14 Dyn. Mtg. • AT-172/ARN-14 Antenna.

AN/ARN-82 NAV/COM RECEIVING SET

A solid-state VOR/Localizer Receiver widely used aboard all types of military and civilian aircraft. This set is a direct retrofit for the AN/ARN-30E and 30F. This system consists of the following major components: R-1388/ARN-82 Radio Receiver • C-6873/ARN-82 Control • MT-3600/ARN-82 Mounting • ID-1347/ARN-82 Course Indicator.



AN/APN-22 RADAR ALTIMETER

A microwave altimeter which is designed to measure the terrain clearance of an aircraft without the necessity of adding antennas to other equipment external to the aircraft. The equipment operates in the 4200 - 4400 mc band and is designed to provide reliable operation over the ranges of 0 - 10,000 feet over land and 0 - 20,000 feet over water. The accuracy of indication is 2 feet, from 0 to 40 feet and 5% of the correct terrain clearance from 40 - 20,000 feet. Principal Components: AM-1291/APN-22 Electronic Control Amplifier • MT-803/APN-22 Mounting • RT-160/APN-22 Radar Receiver-Transmitter • ID-257/APN-22 Height Indicator • CY-1409/APN-22 Housing, Receiver-Transmitter



AN/APN-171A ELECTRONIC ALTIMETER SET

A very modern low-altitude, terrain tracking and altitude sensing radar system. Accurate high resolution tracking is maintained at altitudes between 0 and 5000 feet. Major Components: 1 each RT-804A/APN-171(V) Radar Receiver Transmitter. • 2 each AS-1858/APN-171(V) Antennas. • 1 each ID-1345A/APN-171(V) Height Indicator.



DECCA NAVIGATOR MODEL MK-8A

Position Fixing Navigation Sets. Military aircraft of many types and nationalities rely on Decca Aviation Electronics. Over 450 aircraft of the Royal Air Force are equipped with the Decca Navigator; standard equipment in aircraft of Strike Command, Training Command and the Queen's Flight. Contracts have recently been awarded for Decca Navigator equipment in Puma helicopters for the Royal Air Force and Sea-Kings of the Royal Norwegian Air Force.

Decca Doppler has now been installed in Viggen aircraft of the Swedish Air Force, Jaguars of the French Air Force, Royal Air Force Vulcans and for the new Lynx helicopters for the Royal Navy and the British Army. Purpose and Use: The Decca Model Mark-8A Position Fixing Navigation Set is an airborne, hyperbolic navigational system which receives low frequency, unmodulated, continuous wave signals from four ground stations and provides the pilot with aircraft present position data.



A.R.C. TYPE 15F • AN/ARN-30D VOR RECEIVING SET

A compact, digitally tuned VOR receiving system manufactured by Aircraft Radio Corp. Columbia can supply complete systems or major components. Components: R-34A Receiver. • DV-10A Power Supply. • B-13A Converter. • C-81A Control. • A-13B Antenna. • E-14 Mounting. • M-10 Mounting. • IN-10 Course Indicator. • Columbia can also supply the test bench mock-up cable harness for this system.

WELCOME TO COLUMBIA

All of our friends and customers have a standing invitation: please pay us a visit any time you are in the Los Angeles area.

Here, in our own large building in the heart of the San Fernando Valley, you will find on display virtually all the equipment shown in this catalog. Some of that equipment dates back to the years of World War II — and other items are as recent as the latest state of the arts can make them.

Our extensive showrooms are always open for your inspection — with or without any prior arrangements, and it will always be a pleasure to welcome you.

Shown here are a few samples of current inventory on display in our showrooms.

TO SEEK AND TO FIND

If you require an unusual or hard-to-find piece of equipment let Columbia help!

We have contact with factories, dealers, distributors, representatives, and government agencies around the world. All these sources are at our disposal to help procure the exact item you are looking for. Tell us your needs.

SIZE ISN'T EVERYTHING — BUT IT HELPS

"Biggest" in electronics may not always mean "best" — but there's something to be said for size.

Columbia Electronics International, Inc. has, under one roof, one of the largest inventories ever assembled of military, industrial and commercial electronics.

This diversity of merchandise enables you to obtain exactly the item you want, at the lowest market price, in the minimum period of time.

COLUMBIA'S THREE-WAY GOAL

1. To provide you with the finest piece of electronic equipment that most exactly meets your needs.
2. To sell that equipment at the lowest, competitive price.
3. To move that piece of equipment safely, securely, in the minimum time, from our plant to yours.

COLUMBIA ELECTRONICS — A THUMBNAIL HISTORY

Our company was founded in 1946 by Leonard B. Saken. Today, this firm is recognized all over the globe as a primary, dependable source for air, sea and ground military electronic equipment. Our items reflect the history of electronics in America. Some of our products go back to World War II; others are as current as tomorrow's newspaper.

Tell us your needs. Columbia spans the century — and covers the world.

COLUMBIA'S PR SERVICE

Electronics is an affluent industry, and the state of the art changes rapidly.

As a buyer, the big question in your mind is: which items are best for you?

If you're not sure, we will be glad to provide without obligation our Product Research Service, to help you answer that question.

In sending your inquiry just ask for our PR Service. The more you know about what is available — the better are your chances for getting exactly what you want.

SATISFACTION IS A TWO-WAY STREET

Here at Columbia, we do not consider a transaction completed when the material you ordered leaves our plant.

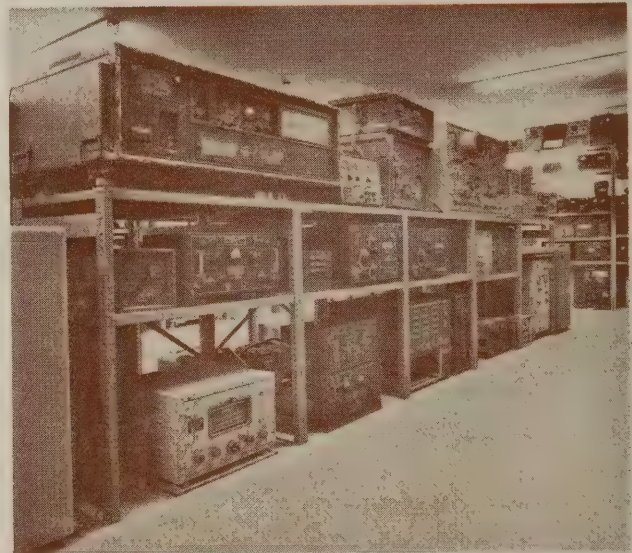
You must be satisfied with that material when it reaches you. And, if for any reason you're not — please let us know promptly and fully.

Customer satisfaction has been the cornerstone of Columbia's growth.

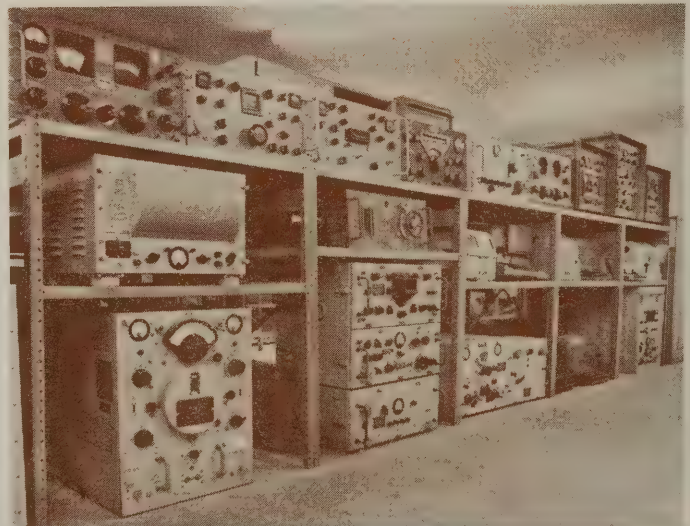
WE GUARANTEE SATISFACTION.



MISCELLANEOUS TEST EQUIPMENT



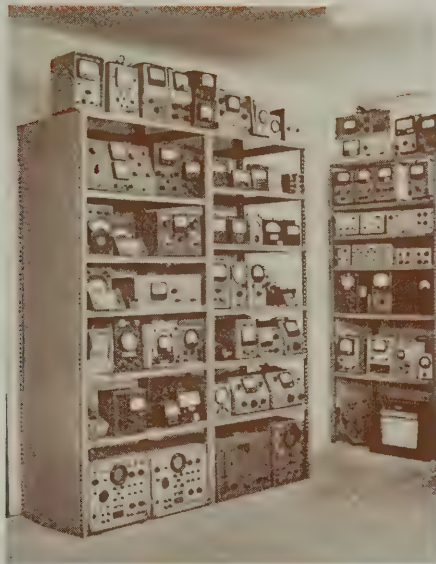
COMMUNICATIONS EQUIPMENT



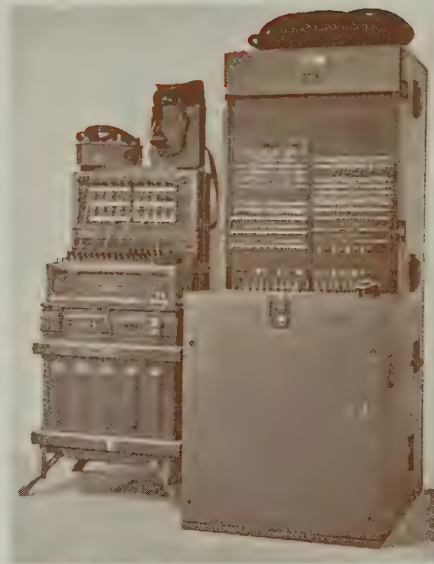
COMMUNICATIONS EQUIPMENT

COLUMBIA ELECTE

ELECTRONICS, INTERNATIONAL!



TEST EQUIPMENT



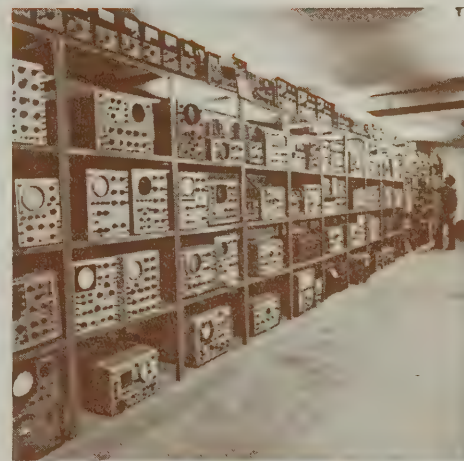
FIELD TELEPHONE SWITCHBOARDS



TELETYPE AND TEST EQUIPMENT



COMMUNICATIONS EQUIPMENT



TEST EQUIPMENT



DISPLAY OF AN/VRC 12 TRANSCEIVERS

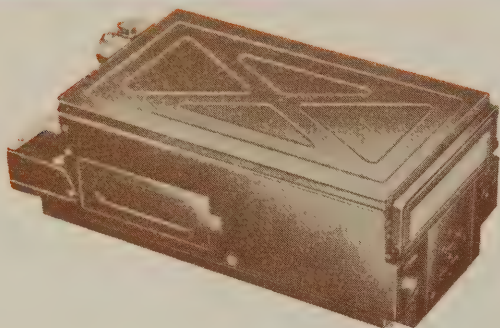


RADIO TRANSMITTERS

ICS DOES MORE THAN PROMISE SATISFACTION. WE GUARANTEE IT!

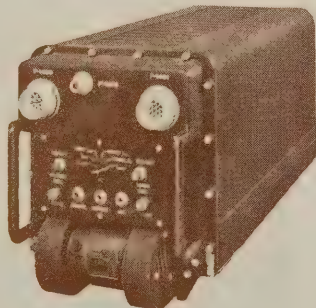


AIRBORNE UHF RADIO SETS



AN/ARC-34 -34A, -34B, -34C UHF RADIO SET

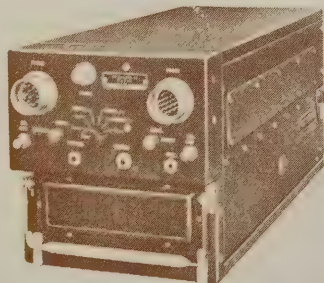
Radio Set AN/ARC-34 is a remotely-controlled miniaturized UHF transmitting-receiving set by RCA which can be accurately preset to any 20 of 1750 frequencies between 225.0 and 399.9 megacycles. Also any one of 1750 frequencies can be manually tuned. This set has a self-contained dynamotor power supply and a pretuned guard receiver usually on 243 mc which provides an "Always Ready" emergency calling channel. This set incorporates features which make it ideally suited for installation in aircraft, where space, versatility, and reliability are at a premium. AN/ARC-34C 3500 channels. **Specifications:** Transmitter Power Output: 8 watts AM • Power Input: 28 VDC at 18 amps • Principal Components: RT-263/ARC-34 Radio Trans. Receiver • C-1057/ARC-34 Control Box • MT-1099/U Mounting Rack • Set of Connectors • All models of AN/ARC-34 series are in stock.



AN/ARC-27 UHF RADIO SET

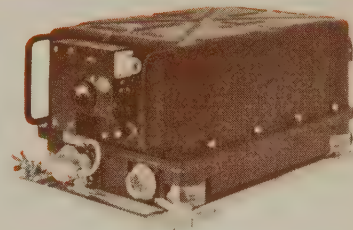
A remotely controlled UHF transmitting-receiving set manufactured by Collins Radio, which can be accurately preset to any 18 of 1750 frequencies between 225.0 and 399.9 mc. With the use of the proper remote control box any frequency between 225.0 and 399.9 mc can be obtained in steps of 100 kc. A guard receiver is also incorporated within the transmitter-receiver to permit constant monitoring of a guard frequency usually 243 mc.

Specifications: Transmitter power output: 9 watts AM • Power Input: 28 VDC at 15 amps. • Principal Components: RT-178/ARC-27 Transceiver • C-626/ARC-27 Control Box.



AN/ARC-55 UHF RADIO SET

A special unpressurized version of the AN/ARC-27. This set has the same specs as the ARC-27 and uses AN/ARC-27 modules. It is widely used in helicopters and low altitude aircraft. **Principal Components:** RT-349/ARC-55 Receiver Transmitter • C-1827/ARC-55 Control Box • MT-1536/ARC-55 Mounting for Receiver-Transmitter



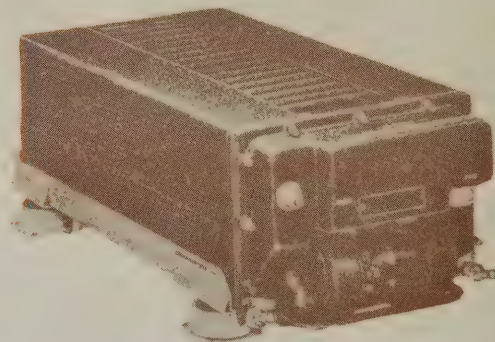
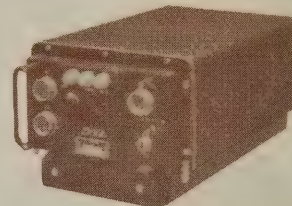
AN/ARC-51, -51A, -51B, -51BX UHF RADIO SETS

The AN/ARC-51 series of UHF radio transceivers were designed for the U.S.A.F. and Navy by Collins Radio. This set is extremely compact and lightweight and is used in the very latest aircraft.

Specifications: Frequency Range: 225-400 mc in 100 kc or 50 kc increments • Manual Set Channels: AN/ARC-51, 1750 channels, 100 kc apart • AN/ARC-51A, -51B, -51BX, 3500 channels 50 kc apart • Preset channels: 19 • RF Power Output: 16 watts • Power Input: 115V/3 Ph/400 cps AN/ARC-51, -51A, -51B • 24 VDC AN/ARC-51BX.

AN/ARC-109 UHF RADIO SET

Provides 30 watts of air-to-air or air-to-ground communication on all of the 3,500 channels in the 225- to 400-MHz range. Solid-state design enhances its reliability, as only one tube, the power amplifier, is used. Extensive microelectronic circuitry and reduced mechanical complexity extend the predicted MTBF of the AN/ARC-109. The control unit features magnetic core storage which enables the pilot to change frequency information in the memory without using tools or code charts. Input Power: 115V/400 Hz/3 Ph.

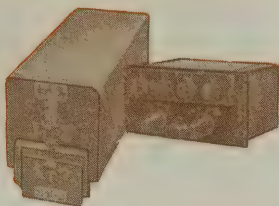


AN/ARC-52 • AN/ARC-52X UHF RADIO SET

Designed by Collins Radio for the U.S. Navy to replace the AN/ARC-27. It is more compact, lighter and puts out more power than the AN/ARC-27. The frequency range and number of channels are the same as the AN/ARC-27. This radio set is available in two models with choice of 24 VDC model or 115 VAC 400 cps. The 24 VDC model uses a dynamotor power supply. The transmitter section has an RF output of approximately 20 watts. **Principal Components:** RT-332/ARC-52 Receiver Transmitter (115 VAC 400 cps 3 Ph.) • RT-424/ARC-52X Receiver Transmitter (24 VDC) • MT-1477/ARC-52 Receiver Transmitter Mounting Rack • C-1607/ARC-52 Remote Control Box



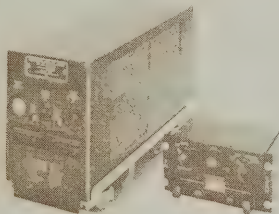
AIRBORNE RADIO SETS



AN/ARC-131 • MAGNAVOX FM-622A VHF FM RADIO SET

A rugged lightweight solid-state radio set designed for the U.S. Army for installation in helicopters and aircraft. It was designed to replace the AN/ARC-44 and 54 Radio Sets. This set uses approximately 80% of the same modules that are used in the AN/VRC-12.

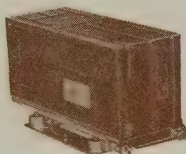
Specifications: Frequency Range: 30 - 75.95 mc in 920 channels crystal controlled, 50 kc apart. • Power Output: 10 - 18W Hi Power, 1W Low Power. • Power Input: 24 - 29 VDC at 4A. • The FM-622A is the Magnavox commercial version of AN/ARC-131 and is identical to the AN/ARC-131. It is used by the U.S. Air Force in the Lockheed C-5 and other aircraft.



AN/ARC-54 VHF FM RADIO SET

Designed by Collins Radio to replace the AN/ARC-44. It is a very compact lightweight set designed for installation in Army light aircraft and helicopters to enable aircraft crews to communicate with ground personnel.

Specifications: Frequency Range: 30.00 to 69.95 mc. • Preset Channels: 800 each spaced 50 kc apart. • Major Components: RT-348/ARC-54 Transceiver • MT-1335/ARC-54 Mounting C-3835/ARC-54 Control Panel.



AN/ARC-44 VHF FM RADIO SET

Radio Set AN/ARC-44 is a compact FM VHF Transceiver primarily used by Army observation planes and helicopters to communicate with ground troops using FM radios.

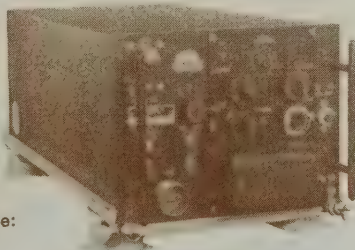
Specifications: Frequency Range: 24 to 51.9 mc FM (280 channels 100 kc spacing) • Power Output: 8 watts RF • Power Input: 24 VDC at 8 amps. • Principal Components: RT-294/ARC-44 Receiver-Transmitter • DY-107/AR Dynamotor Power Supply • MT-1268/AR Mounting for Receiver-Transmitter • MT-1267/AR Mounting for Dynamotor • SB-327/AR Control Box Channel Selector • SB-329/AR Control Box Audio Selector.

AN/ARC-39 HF AM TRANSCEIVER

Remote Controlled. Primarily used aboard naval and Coast Guard Aircraft to communicate with commercial surface craft during rescue operations.

Specifications: Frequency Range: 2 - 9.1 MH. • Preset Channels: 12 receive and 12 transmit.

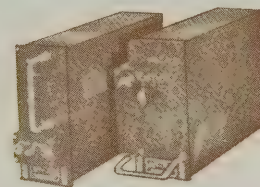
• Frequency Control: Crystal. • Transmitter Output: 10 W • Power Input: 24 VDC. • Dimensions: 11" x 22" x 8". • Weight: 40 lbs including remote control.



AN/ARC-134 • WILCOX 807A VHF RADIO SET

One of the latest aircraft radios currently used in all types of military and civil aircraft. It is a very compact, solid-state one-piece set.

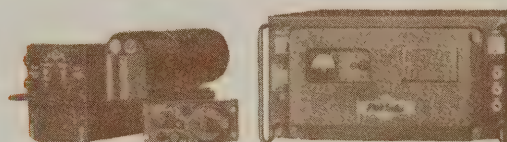
Specifications: Frequency Range: 116 to 149.975 MHz in 680 channels spaced 50 Hz apart. (25 Hz optional). • Power Output: 25 watts AM. • Power Requirements: 27.5 VDC at 10A.



AN/ARC-73A • COLLINS 51X-2B & 17L-7A VHF RADIO SET

The AN/ARC-73A is a U.S. Army equivalent to the Collins 51X-2B Receiver and 17L-7A Transmitter. These sets are directly interchangeable with the commercial models. Outputs are available for VOR and ILS instrumentation. This equipment is widely used in helicopters and light aircraft.

Specifications: Receiver: 108 - 151.95 mc in 50 kc increments • Transmitter: 116 - 149.95 mc in 50 kc increments. • Transmitter Output: 20 watts. • Antenna Impedance: 52 ohms. • Receiver Weight: 15 lbs. • Transmitter Weight: 10.5 lbs. • Major Components: T-879A/ARC-73 or 17L-7A transmitter. • R-1123A/ARC-73 or 51X-2B Receiver. • C-4074/ARC-73A or 614U-6 Control Panel. • MT-2699A/ARC-73 or 390E-2 Mounting.

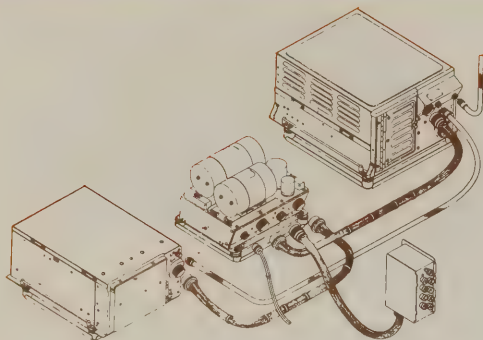


AN/ARC-38, -38A • COLLINS 618S-1 HF RADIO SET

Radio Set 618S-1 (AN/ARC-38) is an airborne high-frequency communications system. It is used primarily for long-range communication on cargo and passenger aircraft. The equipment consists of a transmitter-receiver with a self-contained dynamotor unit, an automatic antenna tuner, and a radio set control. The transmitter-receiver operates on any one of 144 crystal-controlled frequencies that are selected by the operator. A common crystal controlled transmitting and receiving frequency on selected channels. The automatic antenna tuner normally is used to match the impedance of the aircraft antenna to the 52-ohm output of the transmitter.

Specifications: Frequency Range in Mc: 2 to 25 • Frequency Control: Crystal • Type Signal: AM • Type Transmission and Reception: CW, voice • Number of Bands: 4; Band 1: 2 to 3.75 mc; Band 2: 3.75 to 7.25 mc; Band 3: 7.25 to 14.25 mc; Band 4: 14.25 to 25 mc • Number of Preset Frequencies: 144 (maximum) • Power Output: Transmitter - 100W (nominal); Receiver: 300 MW into 300-ohm load • Power Requirements: 30 amp at 27.5 VDC. • Major Components: 1 Automatic Antenna Tuner 180L-3 • 1 Mounting 350D-3 • 1 Mounting 350S-1 • 1 Mounting 350T-3 • 1 Power Supply 418W-1 • 1 Radio Set Control 614C-2 • 1 Radio Transmitter-Receiver 618S-1. Also in stock; AN/ARC-38 and 618S-1, -4 Radio Sets, factory modified, for SSB as well as AN/ARC-38A. The SSB version of the AN/ARC-38.

AIRBORNE VHF & UHF RADIO SETS



AN/ARC-3 VHF RADIO SETS

Radio Set AN/ARC-3 is an airborne remote controlled receiver and transmitter. This equipment features separate receiving and transmitting units which permit the even distribution of weights in the aircraft.

Specifications: Transmitter: Power Output: 8 watts AM Power Input: 28 VDC at 12 amps • Principal Components: R-77/ARC-3 Radio Receiver • T-67/ARC-3 Radio Transmitter • J-68/ARC-3 Power-Junction Box • DY-21/ARC-3 Transmitter Dynamotor • DY-22/ARC-3 Receiver Dynamotor • C-118/ARC-3 Control Box • Set of Connectors • Set of Mounting Plates • AN-104 Antenna • Crystals.

AN/ARC-36 VHF RADIO SET

A special modified version of standard AN/ARC-3 to provide 16 channels instead of the normal 8. All AN/ARC-3 specifications and accessories are the same with the exception of the control box.

AN/ARC-49 VHF RADIO SET

A special designed 48 channel version of the AN/ARC-3. All specifications and accessories are the same as the AN/ARC-3 with the exception of a special control box. Principal Components: R-608/ARC-49 Receiver • T-452/ARC-49 Transmitter • C-1400/ARC-49 Control Box. • For other specifications see AN/ARC-3.

AN/ARC-114, -115, -116 RADIO SETS

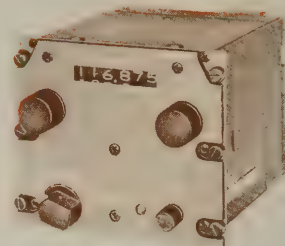
The AN/ARC-114, -115, and -116 comprise a new family of solid-state, very light, one-piece, panel mounted transceivers, designed by GTE Sylvania for the U.S. Army to replace the much heavier vacuum tube radio sets commonly found on Army aircraft.

Specifications: AN/ARC-114 VHF FM TRANSCEIVER • Number of Channels: 920. • Frequency Range: 30 to 75.95 MHz. • Frequency Separation: 50 kHz. • Frequency Accuracy: ± 2.5 kHz. • Transceiver Size: $6\frac{1}{2}$ " L x $5\frac{1}{4}$ " W x $4\frac{1}{8}$ " H. • Transceiver Weight: 7.0 lbs. • Receiver Sensitivity: 0.6 V for 10 dB (S+N)/N. • Guard Receiver: 40.5 MHz. • Transmitter Min. RF Power Output: 10 watts carrier, FM modulation.

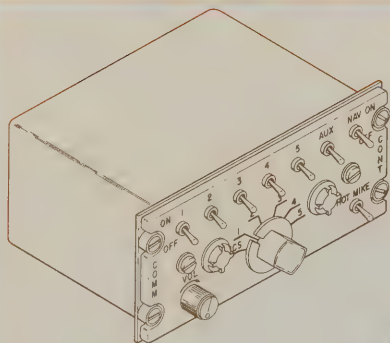
AN/ARC-115 VHF-AM TRANSCEIVER Number of Channels: 1360. • Frequency Range: 116 to 149.975 MHz. • Frequency Separation: 25 kHz. • Frequency Accuracy: ± 3 kHz. • Transceiver Size: $6\frac{1}{2}$ " L x $5\frac{3}{4}$ " W x $4\frac{7}{8}$ " H. • Transceiver Weight: 7.2 lbs. • Receiver Sensitivity: 3.0 UV for 10 dB (S+N)/N (Input 30% modulation; 1 kHz). • Guard Receiver: 121.5 MHz. • Transmitter Min. RF Power Output: 10 watts carrier, AM modulation.

AN/ARC-116 UHF-AM TRANSCEIVER Number of Channels: 3500. • Frequency Range: 225 to 399.95 MHz. • Frequency Separation: 50 kHz. • Frequency Accuracy: ± 8 kHz. • Transceiver Size: $6\frac{1}{2}$ " L x $5\frac{3}{4}$ " W x $4\frac{7}{8}$ " H. • Transceiver Weight: 7.5 pounds. • Receiver Sensitivity: 4 UV for 10 dB (S+N)/N (input 30% modulation; 1 kHz). • Guard Receiver: 243.0 MHz. • Transmitter Min. RF Power Output: 8 watts carrier, AM modulation. • Nominal RF Power Output: 10 watts carrier, AM modulation.

AN/ARC-116A is an improved version of this set with provisions for 20 preset channels, as well as 3500 manually tuned channels.

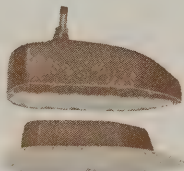


AIRBORNE RADIO ACCESSORIES



C-6533/ARC COMMUNICATIONS SYSTEM CONTROL

Provides an intercommunication capability between two or three crew member stations, each having the same type of control panel. Used primarily aboard Army aircraft. The operator may select any one of five transceivers, eight receivers, and two aircraft crew member stations.

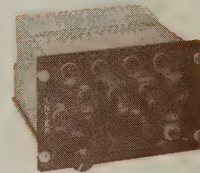


CU-942B/ARC-54 VHF ANTENNA COUPLER

A solid-state broadband aircraft antenna coupler covering the frequency range of 30 - 76 MHz. Contains no moving parts. Was designed to replace earlier units that relied on motor driven switches. It is a direct mechanical replacement for its predecessors. Can be used with the following radio sets: AN/ARC-54, -131 and -114. Can be supplied with the AS-1703/AR Whip Antenna, if required.

AN/AIC-14, -14A, -18, & -25 AIRBORNE INTERCOMMUNICATION SETS

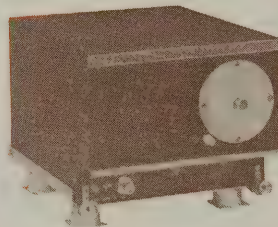
These systems incorporate the latest solid-state circuitry and are used aboard the most advanced military aircraft. Columbia can supply all versions and models of these sets, including spare parts.



COLLINS 490T-1 & 490T-1A 2-30 MHz ANTENNA COUPLERS

The 490T-1 and 490T-1A Antenna Couplers are automatically tuned hf impedance-matching devices, designed to match a variety of antenna types depending upon the driving point impedance of the antenna. Rated input rf power is 630 watts peak-to-peak or 200 watts average. The 490T-1 and 490T-1A are identical except for the transmit/receive relay and the

receive grounding relay included in the 490T-1 and the wiring in the 490T-1A that enables it to match the 437R-1 Helical Monopole Antenna. The couplers will tune whip antennas 25 feet long or longer and most long-wire antennas between 25 and 100 feet. Antennas shorter than 25 feet can be matched with the aid of proper external load coils.





VACUUM TUBE VOLTMETERS & MULTIMETERS



HP 411A



HP 410B

HEWLETT-PACKARD VACUUM TUBE VOLTMETERS

Columbia stocks all popular models of Hewlett-Packard VTVM's, all factory reconditioned and recalibrated, available for prompt delivery at attractive prices. Some of the models stocked are:

Model	Voltage Range	Frequency Range	Functions
400D	1 mv to 300 VAC	10 Hz to 4 MHz	Voltmeter
410B	1V to 1000 VAC/DC	DC to 700 MHz	Volts, ohms
411A	10 mv to 10 VAC	500 kHz to 1 GHz	Voltmeter
412A	1 mv to 1000 VDC	DC to 7 Hz	Volts, ohms, ammeter.

Space does not permit listing all specifications or the many other models we stock. Please contact us for your meter requirements as we stock most models of all the major U.S. instrument manufacturers including the digital versions. All inquiries will receive our prompt attention.

ME-26D/U VACUUM TUBE VOLT-METER

A militarized version of the popular HP 410B. Has a hermetically sealed meter and is ideally suited for use at locations subjected to environmental extremes of humidity and temperature.

Specifications: DC voltage ranges: 0 - 1000V $\pm 3\%$ in 7 ranges. • AC voltage ranges: 0 - 300V $\pm 3\%$ in 6 ranges. • Resistance Ranges: 0 - 500 megohms in 7 ranges. • AC Frequency Range: 20 Hz - 700 MHz. • Input Voltage: 115 or 220V/50 - 1000 Hz/1 Ph.



ME-6D/U AC VACUUM TUBE VOLTMETER

A portable vacuum-tube AC multimeter. This unit also can function as an amplifier and AC ammeter. It is very similar to the Ballantine Model 300A but is militarized.

Specifications: Frequency Range: 10 cps to 250 kc $\pm 2\%$. • Voltage Range: 500 uv to 500V rms in six ranges. • Decibel Scale, -5 to +17 dB. • Input Impedance: 2 meg shunted by 15 uuf. • Output Impedance: 0 to 2000 ohms. • Amplifier Gain: 1600 (63dB). • Power Requirements: 115/50 - 400 cps/1 Ph.



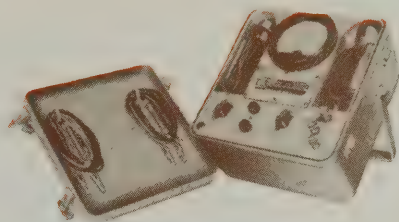
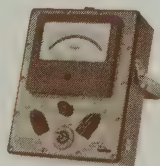
AN/USM-33 AC MULTIMETER

A very rugged and accurate split core type of instrument designed to measure AC current and voltage over a wide range of frequencies between 50 and 1000 Hz without interrupting the circuit under test in order to insert an ammeter.

Specifications: Current: 0 - 15, 60, 150 and 600 amps • Voltage: 0 - 150, 300 and 600 volts • Accuracy: $\pm 2\%$ full scale.

AN/USM-21A LOW RESISTANCE OHMMETER

A precision low resistance portable ohmmeter used to measure resistance ranges from .001 to 10 ohms in 3 ranges. Overall accuracy is $\pm 1\%$ of full scale. This instrument was designed to meet rigid military specifications and can be used in all types of environments.



TS-505D/U VACUUM TUBE VOLTMETER

A portable, vacuum tube voltmeter and DC ohmmeter used in measuring AC and DC voltage and resistance over wide ranges. The peak indicating AC meter scale registers rms voltage, and a zero center scale measures DC voltage of unknown polarity. The set contains an AC rectifier probe and a DC probe.

Specifications: Power Requirements: 115V $\pm 15\%$, 20 VA, 50 to 1,600 cy AC; 3 VDC. • Frequency Range: 30 cy to 500 mc. • Voltage Range: 0 to 200 V rms in seven ranges (AC); 0 to 1,000 V in nine ranges (DC). • Resistance Range: 0 to 1,000 meg in seven ranges $\pm 4\%$. • Input Impedance: 6 meg (min) shunted by 2 uuf at af; 50 meg on 1,000 VDC and ± 500 VDC ranges; 20 meg on all other DC ranges. • Indicating Meter: 1 ma DC (full-scale deflection). • Accuracy: $\pm 1\%$ (full scale VDC); $\pm 6\%$ (full scale for AC sinusoidal input from 30 cy to 500 mc).



TS-352B/U MULTIMETER

A portable multirange circuit analysis and troubleshooting instrument used on electrical and electronic equipment, giving accurate readings, on all ranges, under climatic extremes.

Specifications: Power Requirements: 15 VDC. • Frequency Range: 25 to 5,000 cy. • Voltage Range: 0 to 2.5; 10; 50, 250, 500; 1000 and 5000: AC, DC $\pm 3\%$. • Current Range: 0 to 250 ua, 2.5, 10, 50, 100, 500 ma; 30,000; 300,000 ohms; 3, 30 meg.

AN/PSM-4F MULTIMETER

A very rugged waterproof militarized multimeter very similar to the Simpson Model 260, but improved. It is housed in a shock resistant plastic case and supplied with protective top cover and test leads. Both AC and DC ranges have a 20,000 ohms per volt input resistance. The AN/PSM-4F is fused to prevent burnouts.

Specifications: Voltage Ranges: 0 - 2.5, 5, 10, 25, 50, 100, 500, 1000V, 5000V, AC $\pm 3\%$. • DC Current Ranges: 0 - 1000 ua, 1 MA, 5 MA, 10 MA, 50 MA, 500 MA, 1A, 10A $\pm 3\%$. • Resistance Ranges: 0 - 10K, 100K, ohm: 1, 10, 100 meg $\pm 5\%$. • Size: 7 1/2" H x 6" W x 4 1/2" D. • Weight: 6 lbs.



AN/PSM-6B MULTIMETER

A very reliable extremely rugged portable multimeter widely used by the U.S.A.F. Supplied with cover and HV adapter. Features built-in overload protection to prevent burnout.

Specifications: DC current: 100 ua - 10a in 10 ranges • Ohms: 0 - 30 meg in 5 ranges • DC voltage: .5 - 5000V in 8 ranges • AC voltage: .5 - 1000V in 7 ranges • Overall Accuracy: ± 3 to $\pm 4\%$, depending on range • Overall Dimensions: 8 1/2" x 7 1/4" x 4 1/2" • Net Weight: 8 lbs. • Write for complete specifications.





RF SIGNAL GENERATORS

AN/URM-103 FM SIGNAL GENERATOR • 18-80 MHz

The Army's latest solid-state RF signal generator designed to align the latest FM tactical radio sets including the AN/PRC-25, -77 and AN/VRC-12. This precision unit also covers the frequency ranges of these new radio sets, as well as their predecessors. It was designed to replace the AN/URM-48 Signal Generator.

Specifications: Frequency Ranges: RF Range: 18 - 80 MHz in four Bands. • IF Range: 4.3, 5.6, 5.624, 5.650, 10, 11.5 MHz. Crystal Controlled plus provisions for two additional frequencies. • Frequency Dial Accuracy: .5% of indicated frequency. • Resetability: Better than $\pm 0.00375\%$. • Internal Modulation: 150, 400, 1000 Hz. • Deviation: 0 - 40 kHz. • Calibrator Oscillator Frequency: 1 MHz $\pm$ 2 Hz. • Power Input: 115/230V/50 - 400 Hz/1 Ph. • Weight: 97 lbs.

SG-12/U • AN/URM-48 FM SIGNAL GENERATOR • 20-100 MHz

A portable, field-type instrument used in servicing FM receivers. It provides calibrated signals for the alignment of RF and IF circuits and for measurements of operating sensitivity, stage gain, and receiver fidelity with external audio oscillator.

Specifications: Power Requirements: 75W, 115 or 230V, 50 to 1,000 cy, 1 Ph. AC. • Frequency Range: RF, 20 to 100 mc in five bands; IF, 9 crystals, 1.4, 2.515, 2.65, 2.88, 4.3, 4.45, 5, 5.35, 15 mc. • Type of Emission: CW, FM. • RF Modulation: 100 to 20,000 cy (ext FM); 1,000 cy $\pm 5\%$ (int FM). • Deviation Ranges for Internal RF Modulation: 0 to 25 kc, 0 to 50 kc, 0 to 100 kc. • Type of Calibration: Every 1 mc in the 20 to 50 mc range, every 2 mc in the 50 to 100 mc range, crystal markers. • External Modulation Input: 8V, sine wave (approx.). • Signal Output: .05 to 10,000 uv (RF); .5 to 1,000,000 uv (IF). • Input Impedance: 600 ohms (ext mod). • Signal Output Impedance: 10 ohms $\pm 10\%$, (RF); 25 ohms (IF). • Generator Load Impedance: 80 ohms RF loading (min); 250 ohms if leading (min). • Accuracy: $\pm 5\%$, direct reading, RF indication; $\pm .03\%$, indirect reading, RF indication; $\pm .005\%$ if crystal indication; ± 1 dB, $\pm 12.5\%$ RF deviation indication; ± 2 dB, output voltage indication.

AN/URM-70 • SG-3/U FM SIGNAL GENERATOR • 50-400 MHz

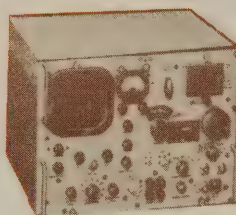
Military version of the Measurements Corp. Model 95 FM Laboratory Signal Generator. Ideal for servicing all types of FM radio sets within its frequency range.

Specifications: Frequency Range: 50 - 100 MHz, 100 - 200 MHz, 200 - 400 MHz. • Types of Output: CW unmodulated RF. • FM internally modulated at 1000, 1600 or 20,000 Hz or externally modulated at 250 - 70 kHz. • FM Frequency Deviation: 50 - 100 MHz: 0 - 15 kHz, 0 - 75 kHz, 0 - 150 kHz. 100 - 200 MHz: 0 - 30 kHz, 0 - 150 kHz, 0 - 300 kHz. • Output Signal Level: .1 to 100,000 uv. • 50 ohms • Dial Calibration: $\pm 1\%$. • Weight: 72 lbs. • Power Requirements: 115V/50 - 60 Hz/1 Ph. 200 - 400 MHz: 0 - 60 kHz, 0 - 300 kHz, 0 - 600 kHz. • Dial Calibration: $\pm 1\%$. • Weight: 72 lbs.

TS-510/U • AN/USM-44 • H.P. 608D SIGNAL GENERATOR • 10-420 MHz

The TS-510/U is the military version of the Hewlett-Packard model 608D Signal Generator. The specifications for the TS-510/U are identical to the HP-608D.

Specifications: Frequency Range: 10 to 420 mc in 5 bands. • Frequency Calibration Accuracy: .5% (built-in crystal calibrator). • Output Attenuator: 350 mv to 0.1 mc ± 2 dB. • Output Impedance: 50 ohms. • Modulation: 400 and 1000 cps internal. H.P. 608D. • TS-510/U.



AN/TRM-3 • SG-24/TRM-3 • SWEEP GENERATOR • RF SIGNAL GENERATOR • OSCILLOSCOPE • 15-400 MHz

The AM/TRM-3 is a precision-made, rugged, portable, multi-function test set for laboratory, production or field use. The RF is taken from an accurately calibrated piston-type attenuator. All RF circuitry is housed in a cast aluminum box to eliminate RF leakage and im-

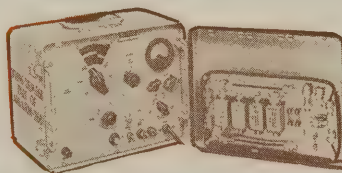
prove stability. This unit has been proven to be highly acceptable by the armed forces.

Specifications: Frequency Range: 15 to 400 MC CW, AM and FM. • Sweep Width: $\pm 1\%$ to $\pm 20\%$ of center frequency. • Crystal Markers: Every 200 kc, 1 mc, 5 mc or 20 mc. • Frequency Accuracy: $\pm .5\%$. • Output Power: .1uv to .15V into 50 ohms ± 1 dB. • Power Input: 115V/50 - 1000 cps/1 Ph.

AN/URM-25D RF SIGNAL GENERATOR • 10 Hz-50MHz

A very compact, highly reliable and accurate portable RF signal generator. This unit is widely used by all branches of the armed forces.

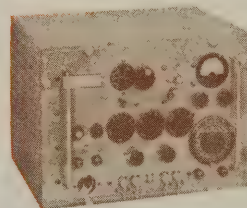
Specifications: Frequency Range: 10 kc to 50 mc in 8 bands accuracy $\pm .5\%$. • Output Voltage: High output fixed at 2 volts. • Calibrated Voltage Output: .1 to 100,000 microvolts $\pm 10\%$. • Output Impedance: High output 500 ohms. • Calibrated Output: 50 ohms $\pm 1\%$. • Crystal Calibrator: Internal Crystal Checkpoints every 1 mc. • Modulation: Internal 400 and 1000 cps $\pm 5\%$. • Power Requirements: 115V/50 - 1000 cps/1 Ph. • Dimensions: 10" H x 13" W x 10" D. • Weight: 35 lbs.



AN/URM-26B RF SIGNAL GENERATOR • 4-405 MHz

A very compact, highly reliable and accurate, portable RF signal generator. This unit is widely used by all branches of the armed forces. This unit uses a piston-type attenuator that is gear driven.

Specifications: Frequency Range: 4 to 405 mc in 6 bands. • Output Voltage: Continuously adjustable between .1 and 100,000 UV $\pm 10\%$. • Frequency Accuracy: $\pm .5\%$ restability on a vernier dial to $\pm .1\%$. • Output Impedance: 50 ohms nominal. • Leakage: Negligible (RF circuitry housed in cast aluminum box). • Frequency Stability: .02%. • VSWR: Less than 1.2 over full range. • Modulation: Internal 400 and 1000 cps $\pm 5\%$ 0 - 50% adjustable. • Power Requirements: 115V/50 - 100 cps/1 Ph. • Size: 10" x 13" x 10". • Weight: 32 lbs.



TS-418/U • AN/URM-49 SIGNAL GENERATOR • 400-1000 MHz

Portable test equipment used with radio and radar receivers in measuring standing wave ratios, antenna characteristics, transmission line characteristics, conversion gain, and receiver sensitivity. It consists essentially of an RF oscillator, a power supply, and RF power monitor, a

modulator section, including a pulse generator, and an output section.

Specifications: Power Requirements: 130W, 115V $\pm 10\%$, 50 to 1,600 cy, .9 pf, 1 Ph. AC • Frequency Range: 400 to 1,000 mc $\pm 1\%$. • Type of Emission: AM, CW, PM • Power Output: 1 mw • Output Impedance: 50 ohms • Attenuation: .2 UV (-120 dB) to .2V (0 dB) $\pm 2\%$. Internal Modulation: Rate: 40 to 4,000 pps; Width: .5 to 10 usec Delay: 3 to 300 usec • External Modulation: Pulse: 40 to 6,000 pps, .5 to 20 usec, ± 40 to ± 70 V; Sine Waves: 100 cy to 100 kc at 3V for 30% modulation. • Sync Out Pulse: 65V peak, no load; 42V peak into 500 ohm load shunted by 1,500 uuf; 5 usec (max.) width.



RF SIGNAL GENERATORS



TS-403/U • AN/URM-61 • H.P. 616A SIGNAL GENERATOR

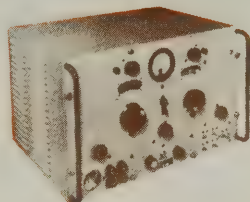
Signal Generator TS-403/U is portable test equipment used with radio and radar receivers in measuring standing wave ratios, antenna characteristics, transmission line characteristics, conversion gain, and in other applications requiring small amount of RF power.

Specifications: Power Requirements: 150W (approx.), 115 or 230V $\pm 10\%$, 50 to 1,600 cycles, .9 pf, 1 Ph. AC. • Frequency Range: 1,800 to 4000 mc $\pm 1\%$. • Type of Emission: CW, FM, PM. • Pulse Repetition Rate: 40 to 4,000 pps. • Pulse Width: .5 to 10 usec. • Frequency Modulation: Phase variable 180 electrical deg. (approx.) at power supply frequency. • Timing: Undelayed or delayed from 3 to 300 usec (ext or int. pulse). • Modulation Pulse: Square wave (ext or int.), 40 - to 70-V peak, producing 100% modulation. • Power Output: 1 mw (max.), 0 to -127 dBm (continuously variable). • Voltage Output: .1 to 224,000 uv. • Output Impedance: 50 ohms. • Voltage Standing Wave Ratio: Less than 5 dB, looking into output terminals. • Accuracy: ± 2 dB (amplitude). HP 616B also available.



TS-621/U • AN/URM-52 • H.P. 618B SIGNAL GENERATOR

Frequency Range: 3800 - 7600 mc • CW, FM, square wave and pulse modulated. • Frequency Calibration Accuracy better than $\pm 1\%$. • Stability 0.006% per degree C change in ambient temperature. • Output Range: 0.223V to 0.2 uv (0 dBm to -127 dBm) into 50 ohm load. • Attenuator Accuracy within ± 2 dB -7 dBm to -127 dBm. • Internal Impedance 50 ohms, SWR less than 2 • Internal pulse modulation: Rep. rate variable 40 to 4000 pps, pulse width variable 0.5 to 10 usec. • Synchronizing Out: either simultaneous with RF (positive) or in advance of RF pulse variable 3 to 300 usec one usec or better rise time • External synchronizing: (sine wave) 40 to 4000 cps, amplitude 5 to 50 volts rms: (Pulse) 0 to 4000 pps, width 0.5 to 5 usec, rise 0.1 to 1 usec. • Internal square wave variable 40 to 4000 cps. • External Frequency Modulation: Provides capacitive coupling to repeller of Klystron. Maximum deviation is approximately 5 mc. • Power: 115V 50/60 cycle. •

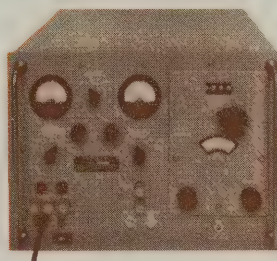


TS-419/U • AN/URM-64 • 900-2100 MHz SIGNAL GENERATOR

This compact portable signal generator is a self-contained directly calibrated generator of continuous-wave or pulse modulated radio frequency signals for testing radio, and radar equipment in the frequency band from 900 to 2100 mc/s (single dial control

directly calibrated to $\pm 1\%$).

Specifications: Frequency Range: 900 to 2100 mc in one band. • Power Output: Zero dBm to -120 dBm continuously adjustable to .2 uv into 50. • Output Impedance: 50 ohms with VSWR of 2:1. Power Requirements: 115V - 10%, 50 to 1600 cycles, single phase, 200 watts. • Type of Emission: CW, PM.



AN/URM-149 UHF FM SIGNAL GENERATOR • 600-1850 MHz

A portable signal generator designed to be used with the Army's latest radio sets such as the AN/GRC-50 and AN/GRC-103, or any other set operating within its frequency range.

Specifications: Frequency Range: 600 - 1850 MHz • Type of Output: RF; unmodulated or FM internal modulation Characteristics: Frequency available: 1, 1.6,

20, 68 and 108 kHz. Deviation: 0 - 300 kHz. Modulation Pulse Repetition Frequency: 300 - 380,000 pps • RF Output Impedance: 50 ohms • RF Output voltage: .1 uv — 100,000 uv • RF Output Power: -7 to -127 dBm. • Input Voltage: 115 or 230V/50 - 60 Hz/1 Ph.

O-1131/GRC FREQUENCY SYNTHESIZER SIGNAL GENERATOR

The O-1131/GRC was manufactured for the U.S. Air Force by Manson Labs Division of Hallicrafters. It generates more than 64,000

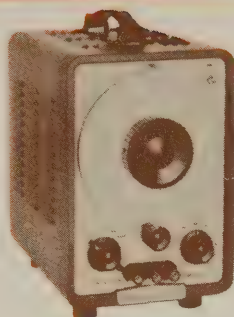
frequencies in the range of 2 - 34 mc. The stability of the output frequencies are 1 part in 10^8 per day. This unit may be used as a frequency standard, Transmitter Exciter, or Receiver Local Oscillator.

Specifications: Frequency Range: 2 - 34 mc. • Band 1: 2 - 4.25 mc in 125 cy steps. • Band 2: 4 - 8.5 mc in 250 cy steps. • Band 3: 8 - 17 mc in 500 cy steps. • Band 4: 16 - 34 mc in 1000 cy steps. • Output Level: Adjustable 1.0 to 2.5V. • Output Impedance: 50 ohms. • Readability Error: Zero. • Resetability Error: Zero • Internal Reference: 1000 kc Crystal in oven. • Power Input: 105 - 125V/50 - 60 cps/1 Ph.

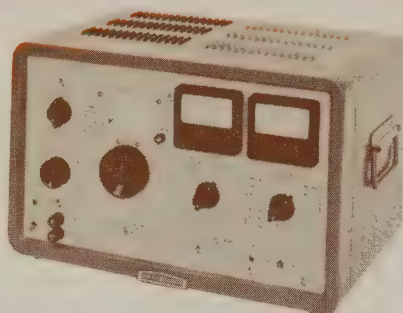




RF & AF SIGNAL GENERATORS



HP200CD



HP606A

HEWLETT-PACKARD SIGNAL GENERATORS

Columbia stocks all popular models of Hewlett-Packard RF and AF signal generators, all factory reconditioned and recalibrated, available for prompt delivery at attractive prices. Some of the models stocked are:

Audio Frequency Signal Generators

Model	Frequency Range	Max. Output
HP200AB	20 Hz to 40 kHz $\pm 2\%$	1W
HP200CD	5 Hz to 600 Hz $\pm 2\%$	160 mw
HP201C	20 Hz to 20 kHz $\pm 1\%$	3W
HP202C	1 Hz to 100 kHz $\pm 2\%$	160 mw
HP 205AG	20 Hz to 20 kHz $\pm 2\%$	5W

Radio Frequency AM & CW Signal Generators

Model	Frequency Range	Output
HP606A	50 kHz to 65 MHz	.1 μ V to 3V
HP608C	10 to 480 MHz	.1 μ V to 1V
HP608D	10 to 420 MHz	.1 μ V to .5V
HP612A	450 to 1220 MHz	.1 μ V to .5V
HP614A	800 to 2100 MHz	1 mw
HP616A	1800 to 4000 MHz	1 mw
HP618B	3800 to 7600 MHz	1 mw
HP620A	7010 to 11,000 MHz	.1 mw
HP623B	5925 to 7725 MHz	1 mw
HP624C	8.5 to 10 GHz	1 mw
HP626A	10 to 15.5 GHz	10 mw to 1 pw
HP628A	15 to 21 GHz	10 mw to 1 pw

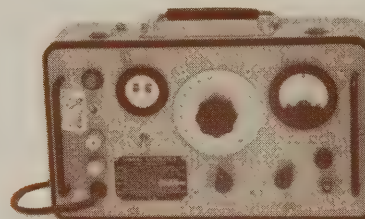
These are only a portion of the signal sources stocked. We also carry General Radio, Singer, Polarad, Boonton, and many other brands and models. Please write for full specifications and prices on any selected model in which you are interested.



TS-382/U AF SIGNAL GENERATOR

A portable audio oscillator providing a sine wave output voltage over its frequency range. A vibrating reed frequency meter permits a check at two points. The equipment contains a thermostatically controlled heater.

Specifications: Power Requirements: 115 to 120V, 50 to 1,600 cy, 1 Phase AC. Frequency Range: 20 to 200,000 cy $\pm 2\%$ in four ranges. • Frequency Meter Check Points: 60 cy, 400 cy $\pm 75\%$. • Type of Emission: CW. • Output Voltage: 1 μ V to 10V $\pm 3\%$ in seven ranges. • Temperature Range: -40°C to 85°C (operating). • -40°C to 85°C (non-operating). • Humidity Range: 0 to 100% (rel.). • Altitude Range: Sea level to 10,000 feet.



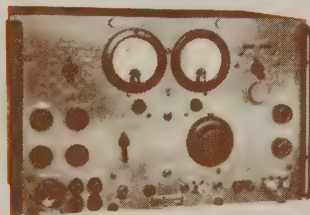
AN/URM-127 AF SIGNAL GENERATOR

The latest military portable solid-state audio oscillator for general purpose use. Incorporates a vibrating reed frequency meter to provide a self-check at 60 and 400 Hz. This unit supercedes the TS-382/U series of audio oscillators.

Specifications: Frequency Range: 20 - 200,000 Hz $\pm 2\%$ in four bands. • Power Output: 200 mw @ 500 ohms load. • Signal Amplitude: 0 - 10 VAC rms in 7 ranges. • Output Load: 1000 ohms for calibrated output voltage. Input Voltage: 115V/50 - 70 or 380 - 420 Hz/1 Ph. • Dimensions: 13" W x 8-3/4" H x 7-1/4" D. • Weight: 14 lbs.



AVIONIC SIGNAL GENERATORS

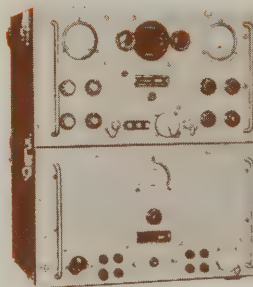


SG-66/ARM-5 • AIRCRAFT RADIO CORP. H-14A OMNI SIGNAL GENERATOR

The aircraft radio H-14 omni signal generator provides simulated omni navigational radio signals for servicing aircraft nav/com receiving equipment. The SG-66/ARM-5 is the military equivalent to the

very popular A.R.C. H-14 and H-14A.

Specifications: Frequency Range: 108 to 132 mc (crystal controlled two channel). • Type Emission: AM and FM or AM only. • Power Output: 0 - 20,000 μ V.



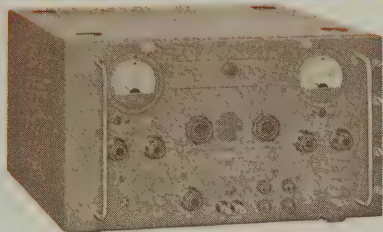
SG-1/ARN • HP BOONTON 211A RF SIGNAL GENERATOR

Designed for the testing and calibrating of omni range radio receiving sets. This unit is used with the Collins 479S-3 or military MD-83A/ARN audio modulator to simulate omni signals. The SG-1/ARN is the military equivalent to the HP Boonton Radio model 211A.

Specifications: Frequency range: 88 - 140 mc variable, 110.1 and 114.9 crystal controlled • Type of Output Impedance: 52 ohms • Power Input: 115V/1 Ph./60 cps.



AVIONIC SIGNAL GENERATORS & SPECIAL TEST EQUIPMENT



HP BOONTON 232-A • SG-2/GRM-4 • AN/GRM-4 GLIDE SLOPE SIGNAL GENERATOR

A crystal controlled RF and IF signal generator used to maintain all types of glide slope receivers. The SG-2/GRM-4 is the military equivalent to the HP Boonton 232A.

Specifications: RF Range "A": 329.3 to 335.0 mc in increments of .3 mc. • Range "B": 20.7 mc. • RF Output: 1 uv to .2V $\pm$ 10%. • Power Requirements: 115V/60 Hz/1 Ph.



MD-83A/ARN • COLLINS 479S-3 OMNI MODULATOR

Modulator MD-83A/ARN and Collins 479S-3 are used with the SG-1/ARN and Boonton 211A RF Signal Generator to provide full omni simulation for bench service of aircraft omni-navigation radio equipment. The MD-83A/ARN is the military equivalent of the Collins 479S-3.

MK-252/ARN MAINTENANCE KIT

Provides a convenient means of inter-connecting and testing various components of the AN/ARN-30 series, as well as the Aircraft Radio Corp. Type 15 series NAV/COM Receiving Sets.

SG-13/ARN • COLLINS 479T-2 VOR-ILS SIGNAL GENERATOR

A portable test set for ramp testing of navigation and ILS receivers. May be used inside or outside the plane for an over-all check on the installation from receiving antenna to indicating instruments. Complete coverage of all channels from 108.0 through 135.9 and 329.3 through 335.0 mc. RF level can be varied from 4 to 200,000 microvolts. Signals include: VOR, LOC, glideslope, 1000 cps audio tone. Size: 19" W x 18" H x 10 1/2" D. Power Input: 24 VDC.



AN/ARN-6 BENCH TEST HARNESS & MOCK-UP

This is a complete bench test harness with all cables, plugs, mounts, antenna shield cabinet and racks required to check out the AN/ARN-6 aircraft radio compass.

AN/ARM-38 TEST ALIGNMENT FACILITIES KIT FOR AN/ARC-52

For AN/ARC-52 and -52X Radio Sets. Consists of a complete kit of module extenders, test cable, and tools required to repair and align the AN/ARC-52 and AN/ARC-52X radio sets.

MK-731/ARC-51X MAINTENANCE KIT FOR AN/ARC-51

A portable maintenance kit to facilitate the troubleshooting, and alignment of AN/ARC-51X and AN/ARC-51BX Radio Sets. This set provides facilities for bench testing or servicing the AN/ARC-51 BX Radio Sets aboard the aircraft.

SPECIAL TOOL KIT FOR AN/APN-22

Consists of eight separate test fixtures and jigs used to service the AN/APN-22. Write for specification sheet. Manufactured by Raytheon for U.S. Navy.



RF WATTMETERS



AN/URM-120 RF WATTMETER

A bidirectional in-circuit coaxial RF power meter designed by Sierra Electronics. Supplied with three plug-in coupler detectors and a carrying case. This set is very similar to the Sierra Model 164 Series.

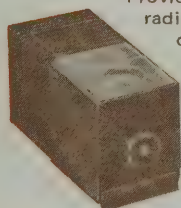
Specifications:

Frequency	Power Ranges Watts
2 - 30 MHz	50, 100, 500, 1000 watts
25 - 250 MHz	10, 50, 100, 500 watts
200 - 1000 MHz	10, 50, 100, 500 watts

ME-82/U RF WATTMETER

Provides power output indications of AM, FM and CW radio transmitters, while functioning as an air cooled dummy load.

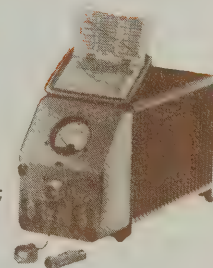
Specifications: Frequency Range: 50 - 600 MHz. • Power Range: 0 - 120 watts. • Input Impedance: 52 ohms. • Accuracy: $\pm$ 5%.



TS-118A/AP • BIRD 693 RF WATTMETER

A general purpose RF wattmeter and 52 ohm dummy load, manufactured by Bird Electronic Corp. It uses plug-in coaxial thermocouples. Unit is supplied with all accessories and an aluminum carrying case.

Specifications: Frequency Range: 20 - 1400 mc. • Power Range: 20 - 100 mc, 2 - 300W; 100 - 300 mc, 2 - 500W; 300 - 750 mc, 2 - 250W; 750 - 1400 mc, 2 - 125W.



ME-11/U RF WATTMETER • BIRD MODEL 611

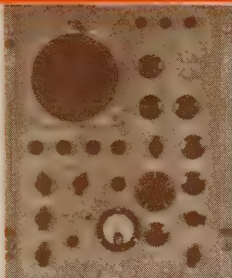
An RF absorption-type equipment used in measuring power output and loss in transmission lines, and in-tuning transmitters. It may also be employed as a dummy load, a modulation monitor, and an RF resistance.

Specifications: Frequency Range: 100 to 500 mc; • Power Range: 0 to 60W in two ranges. 0 - 15 & 0 - 16W • Impedance: 51.5 ohms • Accuracy: $\pm$ 5% of full scale, between 100 and 500 mc.





IFF TRANSPONDER TEST SETS



AN/UPM-70 IFF TEST SET

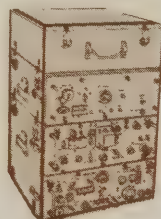
Provides complete facilities for performing test, corrective maintenance and installation adjustments on all Mark X IFF Systems including systems equipped for SIF operation. This set can perform the following tests: Measure RF Power and frequency; simulate all codes; measure receiver bandwidth, frequency and sensitivity; measure PRF. Unit can be used in place of the AN/UPM-98 or 99. This set is used by the U.S. Navy to service the following IFF Sets: AN/UPX-1, -2, -4, -5, -8, -12; AN/APX-6, -7, -17; AN/APA-89; AN/UPA-24, -38. • Major Components: OS-56/UPM-70 Oscilloscope. • SM-85/UPM-70 Coder-Simulator.

AN/UPM-4A TRANSPONDER TEST SET

Specifically designed for testing most types of IFF transponders. This set consists of three major units: an oscilloscope, a coder-simulator, and a power supply. This set performs the following functions: signal generator, wavemeter, power meter, pulse generator, wavemeter, power meter, pulse generator, plus others. This set is also very useful in testing commercial ATC transponders.

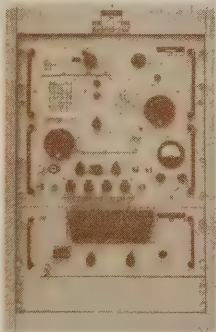
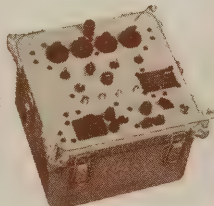
Specifications: Frequency Range: 925 to 1225 mc.

• Type of Modulation: Pulse. • Power Output: -21 dB below one volt rms at 53.5 ohms. • Power Input: 115V/57 - 1800 cps/1 Ph.



AN/UPA-39 & AN/UPA-39A IFF CODER-DECODER TEST SET

Portable, video coder-decoder designed to test military IFF transponders equipped for the SIF mode of operation. This set is a self-contained instrument and can perform certain tests independently; however, it is usually used in conjunction with an AN/UPM-4A or AN/UPM-6B to enable them to test SIF radar sets.



AN/UPM-92A IFF TRANSPONDER TEST SET

Can be used either to determine the operational status of an aircraft IFF transponder system, or as an IFF ground interrogator. The test set may be located at a remote position up to 4 miles from the aircraft under test. The test set will evaluate the performance on a Go/No-Go basis of Mark X or Mark X(SIF) IFF or of air traffic control beacon transponder systems, including side-lobe suppression operation.

Features: Performance of flight-line

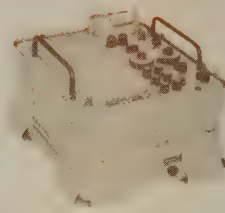
tests and checks without additional test equipment at the aircraft. Performance of tests on the aircraft transponder when aircraft is taxiing or in flight. • Performance of operational tests from one fixed location on large numbers of aircraft. • Selective interrogations on Mode 1, Mode 2, Mode 3, Mode C, or Test Mode. • Tests SLS operation (3-pulse system). • Complete check on reply coding on any code of any mode. In Mark X and Mark X (SIF) systems, I/P and Emergency operation also provided. • 4096 Reply Code Capability on Mode 3/A. • Built-in wavemeter for accurate measurements of transmitted and received frequencies. • Range gating for discrimination against transponders other than the one under test. • Local and remote ACCEPT indications. • High output power and receiver sensitivity for use as ground interrogator. • May be used for complete bench test of Transponder (with suitable attenuator).

AIRBORNE INSTRUMENT LABORATORIES. MODEL 5697 MODE C ALTITUDE INDICATOR FOR USE WITH AN/UPM-92A Used in testing the performance of Mark X SIF Beacon transponders, and provides the AN/UPM-92A with digital readings of the altitude replies of interrogated transponders which are equipped to report altitude automatically.

The indicator can also test altitude (shaft-angle encoders) with the transducers removed from the transponder. NOTE: Top portion of photo is the AN/UPM-92A; bottom portion, the Model 5697 Altitude Indicator. Write for complete specifications.

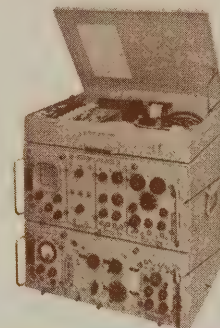
AN/APM-123A TRANSPONDER TEST SET

A portable unit which tests the operational characteristics of IFF transponders. The AN/APM-123A interrogates a transponder and evaluates replies to determine the adequacy of transponder performance. Can be used with the AN/APX-44 and AN/APX-72 and other similar transponder systems.



AN/APM-239A TRANSPONDER TEST SET

A portable test set that provides power and interconnects the various units of a wide range of transponder sets for the purpose of bench testing. This set essentially simulates the wiring harness in the aircraft. Can be used with the following systems: AN/APX-44, 64, 68, and 72.

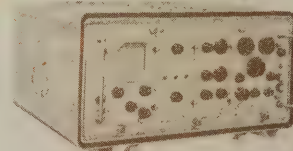


AN/UPM-98 • AN/UPM-98A • AN/UPM-98B IFF TRANSPONDER TEST SET

One of the latest sets for depot maintenance of currently used IFF transponders. Tests all functions of SIF Mark X Transponder Systems. This set consists of two major units: TS-1253/UP: Provides specialized facilities for simulation of coded pulse reply trains, usually produced by airborne and ground transponders, oscilloscope facilities for video analysis, and signal tracing. SM-197/UPM-98: Provides the functions of an RF signal generator, wavemeter, demodulator, PRF counter, and coder capable of simulating interrogation pulse pairs of Mark X IFF Systems, plus single, double and quadruple (emergency mode) Mark X replies. Also available: AN/UPM-98A, AN/UPM-98B, AN/UPM-98C and AN/UPM-125, AN/UPM-135.

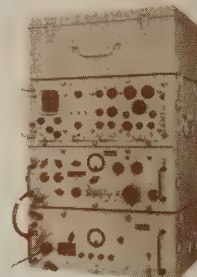
AN/GPM-44 • AN/UPM-111 • TS-1253/UP IFF TRANSPONDER TEST SETS

These sets contain one major unit, the TS-1253/UP, which is composed of a precision oscilloscope, trigger and suppressor pulse generators, and a SIF code simulator. It does not contain RF circuitry. The TS-1253/UP is also part of the AN/UPM-98 and AN/UPM-99 Transponder Test Sets.



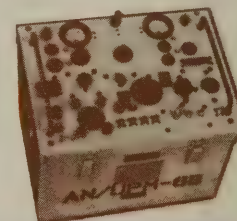
AN/UPM-99 IFF TRANSPONDER TEST SET

Designed for testing IFF equipment of both mark X and SIF types. This set performs most of the common tests required for maintenance of most radar and transponder equipment operating in the 925-1225 mc frequency range. This set includes the TS-1253/UP Radar Test Set which includes a display scope, a sweep and intensity marker unit, a crystal marker and synchronizer unit and a SIF coder unit. Also included in the AN/UPM-99 is the SM-189/UPM-99 RF Signal Generator and wave meter. The Mark X coder in the TS-1253/UP is capable of generating mode 1, 2 and 3 interrogation pulses. The TS-1253/UP is also part of the AN/UPM-98 radar test set.



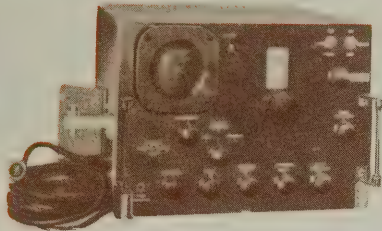
AN/UPM-6B IFF TRANSPONDER TEST SET

Portable test set designed to perform measurements of frequency, power and sensitivity of Mark X series IFF sets. Also very useful in servicing civilian type aircraft transponders and DME equipment. **Specifications:** Frequency: 980 to 1125 mc Signal Generator and Wavemeter. • Power Input: 115V/50 - 1000 cps/1 Ph.





RADAR TEST EQUIPMENT



AN/UPM-33 • TS-148/UP X-BAND SPECTRUM ANALYZER

Portable unit used in testing the over-all system performance of radar systems. It checks the frequency of TR and RT boxes, signal generators, local oscillators, and magnetrons, and measures pulse width, RF spectrum width, and the Q of resonant cavities.

Specifications: Power Requirements: 125W, 105 to 125V, 50 to 1,200 cy AC • Frequency Range: 8,470 to 9,630 mc ± 5 mc (input); 8,500 to 9,600 mc (nom) • Intermediate Frequency: 22.5 mc (1st); 3 mc (2nd) • IF Bandwidth: 50 kc • Type of Reception: CW, pulse • Type of Emission: CW, FM • Power Range: +12 to +70 dBm (input) 1 mw (output) • Attenuation: 3 to 7 dB.

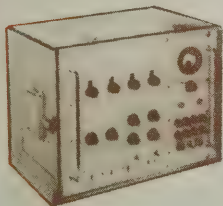


TS-573C/UP RADAR RANGE CALIBRATOR

Portable equipment used in calibrating the range units of pulse-type radar systems. It provides a range strobe output and may also be employed in determining the yardage of an external range mark input.

Specifications: Power Requirements: 180W, 115V $\pm 10\%$, 50 to 1,000 cy,

1 Ph. AC • Crystal Oscillator Frequency: 6.55598 mc, corresponding to 25 yd intervals • Radar Calibration Capabilities: Radar set having prr of 47 to 5,000 pps, pulse lengths from .12 to 6 usec, range sweeps from 1,000 yd to 200 mi, and auto or man tracking • Range Strobe Output: Variable from 100 yd to 200 mi, either pos or neg • Accuracy: Within 10 yd $\pm .01\%$ of actual range.

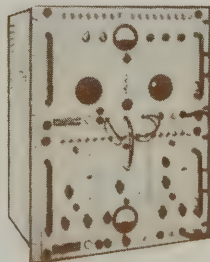


AN/USM-115 RADAR RANGE CALIBRATOR

Self-contained, very modern unit of modular design incorporating a temperature-controlled crystal for internal synchronization and accurate self-calibration. This set was designed for the U.S. Navy to replace the TS-573/UP.

AN/UPM-68 RADAR TEST SET

The primary function of the AN/UPM-68 is to test Moving Target Indicator Radar Sets for Cancellation Ratio or Sub-Clutter visibility ratio. This set tests the ability of the radar to distinguish between wanted moving target reflections and unwanted fixed target reflection. Also generates precision video and pulses for missile guidance and similar applications. The AN/UPM-68 can be used with L-Band, S-Band and X-Band Radar Sets. Major Components: SG-90/UPM-68 Pulse Generator • SG-89/UPM-68 Pulse Generator.

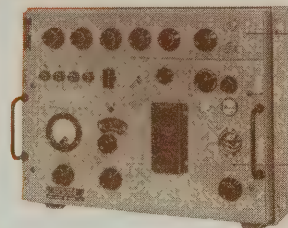
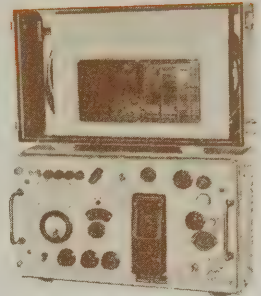


TS-147D/UP RADAR TEST SET

Portable unit used in testing and adjusting beacon equipment and radar systems. It provides FM or CW signals of known power level and frequency for radar receiver testing. The equipment measures frequency, power, spectrum width, frequency fluctuation, tr recovery time, and standing wave ratio of RF signals. The test set permits external modulation to produce a pulsed RF signal.

Specifications: Power requirements: 125W, 115V $\pm 10V$, 50 to 1,600 cy, 1 Ph.

AC • Frequency Meter: Freq. Range: 8,470 to 9,630 mc ± 2.5 mc • RF Power Range: +7 to +30 dBm 1.5 dB • Wattmeter: Power Range: +7 to +30 dbm (input); -7 to -45 dBm (output) • Accuracy: ± 1.5 • Sawtooth Sweep: Amplitude: 0 to 100 VDC • Devel: 60 to -210V • Slope: 0 to +2 usec • Trigger Amplifier Voltage Gain: 500 (approx.) • Signal Generator: Frequency Range: 8,500 - to 9,600 mc • Phase Range: 3 to 50 usec • Power Output: 7 to -85 dbm ± 1.5 dB • Sweep Frequency: 0 to 40 mc • Type of Emission: CW, FM.



AN/UPM-10B RADAR TEST SET

Portable X-Band RF Signal Generator with a built-in pulse generator. It also measures the power level and frequency of external signals.

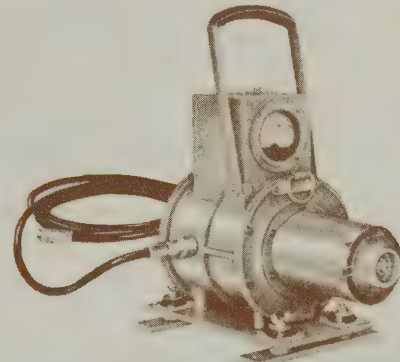
Specifications: Frequency Range: 8500 - 9600 mc ± 2.5 mc. • Type of Emission: CW, FM, PM, Square Wave. • Pulse Repetition Rate: 0 - 3000 pps Pulse Width: .5 to 6 micro seconds

• Pulse Rise Time: .5 micro seconds • Power Output: 5 to 500W (peak). • Power Range: 7 to 30 dBm, -7 to 40 dBm, -42 to 83 dBm • Power Input: 115V/50 - 1000 cps/1 Ph.

AN/UPM-58 RADAR SPECTRUM ANALYZER

Designed primarily to test AN/MPQ-4 & 4A Radar sets operating in the 1.87 cm spectrum. This equipment also functions as a synchroscope.

Specifications: Frequency Range: 15,800 - 16,200 MHz • Frequency meter accuracy: absolute ± 10 MHz. Relative over 100 MHz range ± 5 MHz. Write for complete specifications.



TS-270B/UP S-BAND ECHO BOX

A portable, handtuned ringing cavity enabling quick, rough analysis of the over-all performance of radar systems. It checks the frequency of radar transmitters and receiver local oscillators, performs spectrum analysis, makes rough relative power measurements, and checks TR recovery time.

Specifications: Frequency Range: 2,630 to 2,970 mc • Voltage Standing Wave Ratio: 1:10 • Impedance: 50 ohms • Q: 47,000 • Temperature Range: -40°F to +140°F.

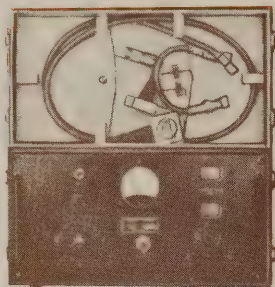


RADAR TEST EQUIPMENT

TS-488/UP X-BAND ECHO BOX

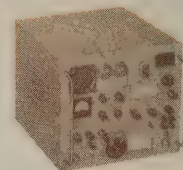
A portable unit used in determining the over-all performance of X-band radar sets. The unit also may be used in comparative measuring of the average power output of radar transmitters, detecting faults in radar systems, and determining the frequency spectrum of radar transmitters. The unit consists of a pick-up antenna dipole, a tunable resonant cavity, a coupling loop, a crystal rectifier, and a dc microammeter.

Specifications: Frequency Range: 8,900 to 9,610 mc ± 5 mc • Decay Rate: 3.5 dB/mc • Ringtime: 24.5 usec.



AN/UPM-44C S-BAND RADAR TEST SET

Designed by Sperry Rand Corp., a portable test set for S-Band (2700 - 3500 mc) testing radar systems. It contains the following sections: a signal generator, general purpose synchroscope, spectrum analyzer and power meter.



AN/UPM-32 X-BAND RADAR TEST SET

The AN/UPM-32 is the X-Band version of the AN/UPM-44. Write for complete specifications.



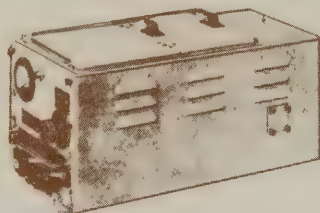
FREQUENCY MEASURING EQUIPMENT



TS-175/U FREQUENCY METER

Portable, crystal controlled, heterodyne type unit used in field testing of CW or MCW RF transmitters and signal generators. **Specifications:** Power Requirements: 6V, 135 VDC • Frequency Range: 85 to 1,000 mc • Type of Reception: CW, MCW • Type of Emission: CW, MCW Power Output Range: 100 uv

(RF), 1 mw (AF) • Modulation: 900 cy ± 300 cy • Temperature Range: 40°C to 55°C • Accuracy: $\pm .04\%$



TS-186/UP FREQUENCY METER

A portable, crystal controlled, heterodyne type used in measuring the frequency of transmitters, oscillators, and signal generators. Application is in field and depot testing.

Specifications: Power Requirements: 70W, 115V $\pm 10\%$, 50 to 1000 cy AC • Frequency Range: 100 to 10,000 mc • Type of Reception: CW, MCW, pulse • Signal Input: 500 uv to 1 V • Signal Output: 10 uv to 20W • Output Impedance: 250 ohms (audio) • Sensitivity: Temperature Range: 40°C to 55°C • Accuracy: $\pm .01\%$.



FR-114/U • AN/TSM-16 FREQUENCY COUNTER

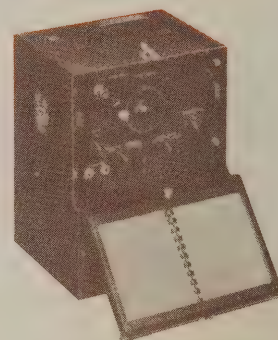
A precision instrument used to count events within the 20 Hz to 1 MHz range. Accurately measures frequencies within its range and indicates them on six nixie tubes.

Specifications: Frequency Range: 20 - 1,000,000 Hz • Counting Interval: .0001, .001, .01, .1 or 10 seconds • Counting Capacity: 999,999 • Display Time: Continuously variable from less than one second to more than 5 seconds • Self-checking capability: Internal 100 kHz crystal • Accuracy: Better than 10 parts per million • Dimensions: 8 3/4" H x 14 1/4" D x 19" W • Weight: 55 lbs. AN/TSM-16 Frequency Counter. Major Component: FR-114/U.

BC-221 FREQUENCY METER SET

A portable, heterodyne type unit used in measuring and calibrating the frequency of transmitters, oscillators, signal generators, and receivers.

Specifications: Power Requirements: 6V, 135 VDC • Frequency Range: 125 to 250 kc; 2,000 to 4,000 kc; 125 kc to 20 mc (extended) • Type of Reception: CW • Voltage Output: 2 mv • Temperature Range: -30°C to +50°C • Accuracy: .01%

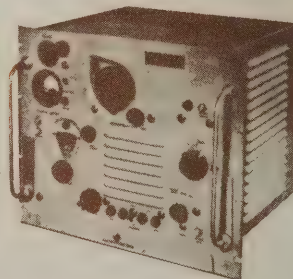


GERTSCH FREQUENCY METERS

The following Gertsch Frequency Meters are available from stock. FM-3 frequency meter 20 to 1000 mc $\pm .001\%$ • FM-4A Frequency Multiplier 100 to 30,000 mc $\pm .00005\%$ • FM-6 Frequency Meter 20 to 1000 mc $\pm .0001\%$ • FM-7 Frequency Meter 20 to 1000 mc $\pm .0001\%$ • FC-1 Frequency Converter 10 kc to 20 mc $\pm .0001\%$.

FR-4/U • AN/URM-79 • AN/URM-82 FREQUENCY METER

A portable, precision heterodyne frequency meter for field or laboratory use for frequency measurements and radio receiver and transmitter calibration. Designed for rack mounting or for use as a table model. Frequency range: 100 kc to 20 mc (7 bands): usable out to 1000 mc • Oscillator Frequencies: 100 - 250 kc (variable) 1250 kc (crystal); 10 kc (blocking); 15 - 250 kc (interpolation) • Frequency Stability: 0.0001% • Accuracy: $\pm 0.001\%$ (calibration) • RF Output: 100 uv (min.) across 51 ohm or any harmonic • Audio Output: 2 mw (min.) across 600 ohm • Method of Interpolation: Built-in Oscilloscope • Power: 115/230V $\pm 10\%$ 50 - 1000 cps.

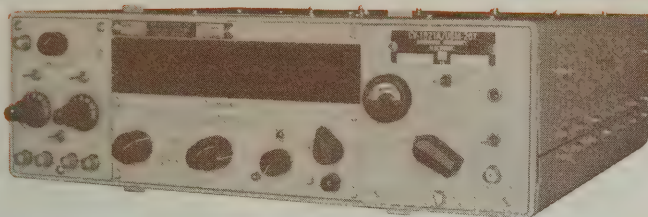


OTHER FREQUENCY METERS AND FREQUENCY COUNTERS

AN/URM-80 (FR-5/U) 10 - 100 mc • AN/URM-81 (FR-6/U) 100 - 500 mc • AN/USM-29 15 kc to 300 mc • Also Available: Hewlett-Packard Frequency Counters. Tell us your requirements.

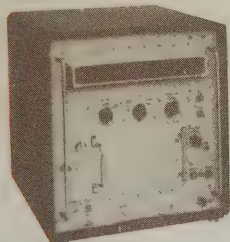


FREQUENCY MEASURING EQUIPMENT



AN/USM-207A DC-TO-500 MHz SOLID STATE COUNTER & TIMER

The latest military solid-state frequency counter and timer designed for general purpose use. Meets the latest military specifications and requirements for use under severest military conditions. Major accessories included are metal front cover for maximum protection and storage of accessories.



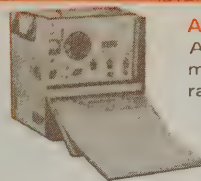
HP 524C



HP 5245L

FREQUENCY COUNTERS

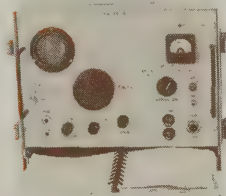
Frequency counters manufactured by Hewlett-Packard, and others are available with any plug-in converter or amplifiers desired. Some of the models available from stock: Hewlett-Packard 524B • Hewlett-Packard 524C • Hewlett-Packard 524D • HP 5245L • AN/USM-26 FR-38/U FR-114/U • AN/TSM-16 • FR-67/U.



AN/URM-32 FREQUENCY METER

A self-contained heterodyne type frequency meter used to measure frequencies in the range of 125 kc to 1000 mc. It may also be used as a Signal Generator which provides a choice of modulated or unmodulated signals.

Specifications: 125 kc to 1000 mc in 3 bands. • Accuracy: .01%. • Power Requirements: 6 VDC at 1A and 180 VDC at 25 ma. • Weight: 27 lbs less dry batteries or power supply. • AN/URM-32 Frequency Meter less power supply PP-1243/U. Power Supply 115V or 230V/50 - 1000 cps/1 Ph.



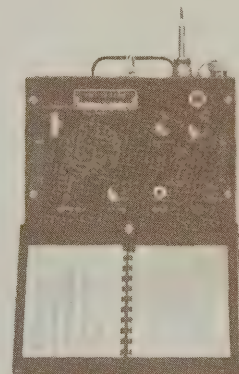
AN/USM-159 FREQUENCY METER

Designed for the U.S. Army to replace the AN/URM-32. It covers the same frequency range and has the same accuracy. It is a fully transistorized unit. The frequency readout is direct on fundamentals on a calibrated filmstrip magnified and illuminated.

TS-323/UR FREQUENCY METER

A portable, crystal controlled, heterodyne-type instrument used in field testing of CW, MCW, or pulsed RF transmitters and signal generators.

Specifications: Power Requirements: 6V, 145 VDC • Accuracy: $\pm .002\%$ • Frequency Range: 20 to 479 mc • Type of Reception: CW, MCW • Type of Emission: CW, MCW • Voltage output: 50 to 1000 uv RF • Sensitivity: 10 mw at 50,000 uv • Temperature Range: $+32^{\circ}$ to $+122^{\circ}$ F.



SEMI-CONDUCTOR & ELECTRON TUBE TESTERS

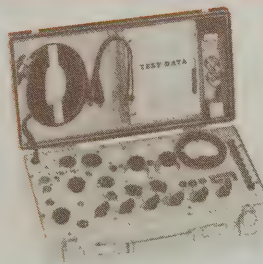
TV-2/U ELECTRON TUBE TEST SET

A portable instrument designed by Hickok for the U.S. Army used to measure dynamic mutual conductance qualities of receiving, transmitting and special purpose tubes. It detects gas, shorts, detects and measures leakage between tube elements; measures gas current and filament voltage. This tube tester is of the laboratory quality type built for very rugged portable service. It will test most of the tubes used in military and industrial service.



AN/USM-206 SEMICONDUCTOR TEST SET

A modern, portable instrument for the design, development; troubleshooting, and the in-circuit repair of the semiconductor circuits found on printed circuit boards. This set is used in conjunction with any engineering transistor data book.



TV-7/U TUBE TESTER

A portable instrument used in measuring conductance, detecting and measuring internal shorts, checking emission, detecting gas and intermittent contacts of commercial and JAN type electron tubes, and testing pilot lamps having miniature bases. Application is in organizational and field testing and maintenance.

Specifications: Power Requirements: 55W, 115V $\pm 10\%$, 50 to 1,000 cy AC • Mutual Conductance Range: 0 to 3,000; 6,000, 15,000; 30,000 umhos $\pm 10\%$. • Filament Range: 1.1V, 1.5V, 2V, 2.5V, 3V, 5V, 6.3V, 7.5V, 10V, 12.6V, 20V, 25V, 35V, 50V, 75V, 117V.

TS-268/U CRYSTAL RECTIFIER TEST SET

Portable equipment used in testing high frequency rectifiers.

Specifications: Power Requirements: 1.5 VDC. • Meter Range: 0 to 10,000 ohms; 0 to 1 ma DC. • Type of Crystals Checked: IN21, IN21A, IN21B, IN23, IN23A, IN23B, IN25. Temperature Range: -4° F to $+120^{\circ}$ F Accuracy: $\pm 10\%$ (approx.).

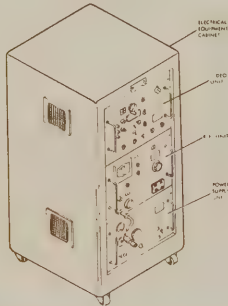
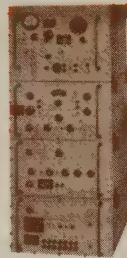




TACAN TEST SETS

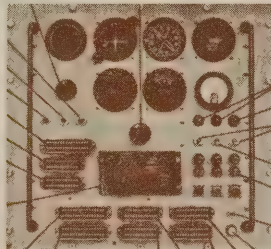
AN/ARM-22 • AN/ARM-22A TACAN TEST SETS

These sets produce simulated Tacan Beacon Signals, and other signals for bench testing most military airborne Tacan Systems. The AN/ARM-22A is a modified AN/ARM-22 that simulates air-to-air signals.



HOFFMAN HLI-103 SERIES TACAN TEST SETS

Commercial sets with similar functions of the AN/ARM-22 series. Columbia can supply most models of the Hoffman HLI-103 series. Please write for data.

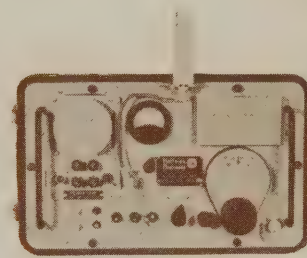
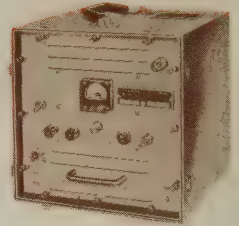


AN/ARM-31 • AN/ARM-31A TACAN INDICATOR TEST SETS

A portable unit that provides instrumentation control functions and power connections for testing the following Tacan systems: AN/ARN-21, 21B, -21C, AN/ARN-52(V), AN/ASQ-19. Used in conjunction with the AN/ARM-22 series or Hoffman HLI-103 series test sets.

AN/URM-101 • AN/URM-101A • AN/URM-101B TACAN TEST SETS

These lightweight, portable test sets are used to bench check and pre-flight test the normal operations of AN/ARN-21 and similar Tacan sets. The AN/URM-101B has provisions for air-to-air ranging and also can be used with the AN/ARN-52(V) or similar Tacan sets.



AN/ARM-25 • AN/ARM-25A TACAN TEST SETS

Portable test set designed by Hoffman Electronics to check accuracy of airborne Tacan Navigation Equipment. Simulates the complex video, audio and RF signals generated by ground Tacan Beacon. Can be used on a bench or on the flight line. Has a radiating antenna and can also be connected directly to equipment under test.

Specifications: Channels: Any one of 63 in low band (1-63), any one of 63 in high band (64 - 126). • Identity: Manual keying or continuous tone. • Peak Power Monitoring: .1 - 4 kw direct reading. • RF Output: variable from -10 dBm to -110 dBm. • Primary Power: 103 - 126V/380 - 420 Hz/1 Ph. • Dimensions: 11" x 14" x 18". • Weight: 49 lbs. • AN/ARM-25 and AN/ARM-25A are very similar electrically and physically. Both models are available for prompt delivery.

THE COLUMBIA GOAL

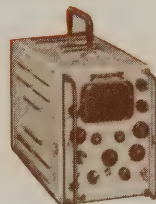
Our company has but one major purpose: to supply you with the exact item you ordered, in the very finest condition, in the shortest possible time, at the lowest possible cost.



OSCILLOSCOPES

AN/USM-32 PORTABLE OSCILLOSCOPE

A very compact Synchroscope designed by the Allen B. Dumont Laboratories for general purpose radar maintenance. This unit is the same as the Dumont model 301A. This scope was designed to replace the AN/USM-24 and OS-8/U. **Specifications:** Vertical Amplifier (at full gain): .28 pp (.1 rms) volt/inch • Frequency Response: from 10 cps to 4 mc • Time Marker Generator: built-in • Amplitude calibrator: built-in • Trigger Generator: built-in • Size: 9" H x 7" W x 17" D • Weight: 20 lbs.



AN/USM-117 TRANSISTORIZED DC-6 MHz OSCILLOSCOPE

The Navy's smallest, most modern fully solid-state portable oscilloscope for general purpose use where reliability is required under adverse conditions. Uses plug-in preamplifiers.

Specifications: CRT Size: 2½" X 2". • Vertical Bandwidth: DC - 6 MHC. • Sweep Ranges: 19 in 1 - 2 - 5 - 10

sequences from .1 microsecond div. to 1 sec. • Horizontal Bandwidth: DC - 500 Hz. • Rise Time: .7 microsecond, maximum. • Power Input: 115V/50 - 1000 Hz/1 Ph. • Dimension: 8" H x 9¾" W x 18½" D (including front cover). • Weight: 23 lbs. complete. • Major Components: OS-106/USM-117 Oscilloscope, MX-2996/USM-117 High gain plug-in preamplifier, CW-541/USM-117 Protective Front Cover with probes and accessories. • Optional Accessories: MX-2995/USM-117 Dual Trace Plug-in DC-6 MHz, Rack mounting adapter panel.





OSCILLOSCOPES

TEKTRONIX OSCILLOSCOPES

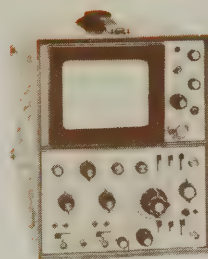
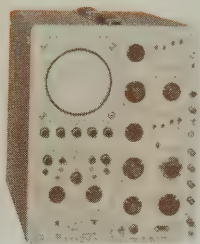
We maintain a large inventory of factory reconditioned and recalibrated Tektronix oscilloscopes and accessories. The following models are available for prompt delivery.

Model	Description
422	15 MHz dual trace portable
453	50 MHz dual trace portable
454	150 MHz dual trace portable
532	5 MHz
533	15 MHz with sweep magnifier
535	15 MHz with delayed horizontal
535A	15 MHz with delayed horizontal
543	30 MHz with sweep magnifier
543A	30 MHz with sweep magnifier
543B	30 MHz with sweep magnifier
544	50 MHz, same as 547, less horizontal display switch
545	30 MHz with delayed horizontal
545A	30 MHz with delayed horizontal
545B	33 MHz, with delayed horizontal
547	50 MHz auto display switching
567	with 3T77, 3S1, 6R1A
575	Transistor curve tracer
581A	85 MHz uses 82 dual trace plug-in
585A	85 MHz uses delayed horizontal 82 dual trace plug-in
661	with 5T1, 4S3 plug-ins

This list represents only a small portion of our oscilloscope inventory. We can supply most plug-in's as well as Hewlett-Packard oscilloscopes. Please write for quotations.

ACCESSORIES AND SPARE PARTS

We can supply replacement parts, spares and accessories for all types of military electronic equipment. Tell us your needs.

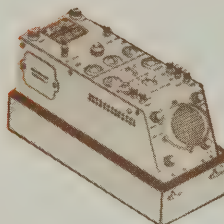


AN/USM-281E 50 MHz OSCILLOSCOPE

The U.S. military's most advanced, ruggedized portable solid-state 50 MHz dual-trace oscilloscope. It includes plug-in vertical amplifier and time base, plus a full set of accessories including probes and a front cover for protection during transit or storage.

Specifications: Vertical: Bandwidth and Risetime: DC to 50 MHz (7 ns) from 5 mV/cm to 10 V/cm in two identical channels. Calibrated Deflection Factor:

5 mV/cm to 10 V/cm at full bandwidth, X5 Magnifier: Allows maximum sensitivity of 1 mV/cm at 5 MHz bandwidth. • Horizontal: Calibrated Time Base: 0.1 μ s/cm to 2 s/cm. • X10 Magnifier: Operates over full time base, increases fastest rate to 10 ns/cm. • Calibrated X-Y Operation: 5 mV/cm to 10 V/cm in 11 steps. • Delay Range: 0.2 μ s to 10 sec. • External Input: 120 mV/cm, 12 mV/cm using magnifier. • Display: Area: 8 x 10 centimeters • Accelerating Potential: 12 kV. • Phosphor: P31 aluminized, Internal graticule. • General: Calibrator: Accessible with probe 300 mV and 1 volt. • Power: 115 V or 230 VAC $\pm$ 10%, 48 - 400 Hz, 85 watts. • Dimensions: 9-1/2" W x 12" H x 24-1/2" D. • Net Weight: 43 lbs. AN/USM-296A Rack Mounting Version also available. Write for complete specifications and prices.



OS-8/U PORTABLE OSCILLOSCOPE

Oscilloscope OS-8/U, having a 3-inch cathode cathode ray tube, is a portable device used in the visual analysis of wave forms of varying electrical potential.

Specifications: Power Requirements: 60W, 105 to 125V, 50 to 1000 cy.

1 Ph. AC • Frequency Range: Horizontal Amplifiers: 0 to 500 kc •

Vertical Amplifiers: 0 to 2 mc • Sweep

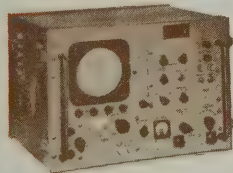
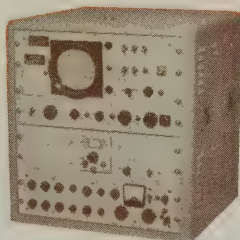
Circuit Oscillator: 3 cy to 50 kc Input Impedance: 1.5 mc shunted by 25 uuf (AC); 2 meg (DC); 9 meg shunted by 11 uuf Deflection Sensitivity: Horizontal: .075 rms V/in (map 1); 17 rms X/in (direct) Accuracy: $\pm$ dB.



SPECIALIZED SSB TEST EQUIPMENT

SINGER SSB-3b SSB SPECTRUM ANALYZER

This unit incorporates all needed analysis facilities to set up, adjust, monitor and troubleshoot SSB Transmissions in the 2 - 40 MHz range. Includes fast signal search plus a continuously adjustable two-tone AF signal generator.



TS-1379/U SSB SPECTRUM ANALYZER

One of the Navy's most modern, portable, precision test sets designed to measure SSB transmitter characteristics such as intermodulation distortion, hum, noise level, carrier or unwanted sideband suppression, and similar characteristics. This

Instrument can be used in conjunction with the SG-376/U two tone AF and IF signal generator. Refer to signal generator section of this catalog. **Specifications:** Input Frequency Range: 485 - 515 Hz and 2 - 30 MHz. Sweep Widths: 150 Hz, 500 Hz, 1 kHz, 3.5 kHz, 7 kHz, 14 kHz, 30 kHz. • Dimensions: 19" W x 16" H x 18" D. • Power Input: 115V/47 - 430 Hz/1 Ph. • Weight: 62 lbs.



SG-376/U TWO-TONE SIGNAL GENERATOR

A solid-state signal generator with two independent AF signal generators and one RF signal generator. The AF frequencies are digitally selected, as are the RF frequencies. The outputs of the AF oscillators are combined in linear summation networks, or are independently available at a level determined by precision attenuators and reference meters. This instrument is used in conjunction with the TS-1379/U SSB spectrum analyzer, or equal, to analyze in-band distortion of SSB transmitters and exciters by the two-tone test method.

Specifications: AF Section: Frequency Range of each oscillator: 10 Hz - 20 kHz. • Outputs: 2 volts rms 600 ohms. • Output Attenuator: 0 - 100 dB in 1dB steps. • IF Section: Crystal Controlled Frequencies: 497.5, 498.5, 501.5, 502.5 kHz. • Output Level: 1V rms 50 ohms. • Input Power: 115V/47-403 Hz/1 Ph. • Dimensions: 19" W x 5 3/4" H x 11" D.



SPECIALIZED SSB TEST EQUIPMENT



AN/USM-324 SSB SPECTRUM ANALYZER

Designed for RF spectrum analysis, especially in narrow band communications systems. Provides a display of the signal amplitude distribution over a selected portion of the RF band. The display has the form of a plot of relative amplitude versus frequency on the screen of a cathode ray tube. Consists of Spectrum Analyzer TS-2884/U, Static Frequency Converter CV-2633/U, Radio Frequency Tuning Unit TN-523/U, and Signal Generator SG-864/U. The integrated components incorporate all required facilities to set up, adjust, and monitor single sideband (SSB) transmissions. The set

also enables rapid analysis of in-band distortion of SSB transmitters and exciters by two-tone test method (to better than -65 dB); measures suppressed carrier levels, residual unwanted sidebands, and monitors transmission bandwidths; enables out-of-band studies of harmonics, cross

products, parasitics, etc.; and is ideal for narrowband RF studies of up to ± 50 kHz in amplitude modulation (AM), frequency modulation (FM), phase modulation (PM), and multiplexed channels.

This set is the U.S. Navy's most advanced SSB Spectrum Analyzer. It is manufactured by Probescope, Inc.

Specifications:

The electrical characteristics of the Spectrum Analyzer Set are listed below. All values are nominal. a. Frequency Range: -10 Hz to 40 MHz. b. Fixed Sweep Widths: -150 Hz, 500 Hz, 3.5 kHz, 7.0 kHz, and 14 kHz. c. Variable Sweep Widths: 0 to 100 kHz. d. Sweep Rates: 1.0 Hz for preset sweep widths of 3.5 kHz, and above.

The sweep rate is 0.1 Hz for preset sweep rates from 150 Hz to 3.5 kHz. e. Hum and Noise Level: 60 dB below fundamental. f. Intra-Unit Impedance: 50 ohms. g. Equipment under test output impedance: The spectrum analyzer set can match 600 ohms balanced or unbalanced and 75 ohms unbalanced inputs below 2 MHz, and 50 ohms nominal from 2 to 40 MHz. High impedance inputs operate from 2 to 40 MHz.

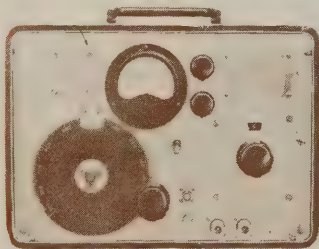


MISCELLANEOUS TEST EQUIPMENT



CRYSTAL IMPEDANCE METERS

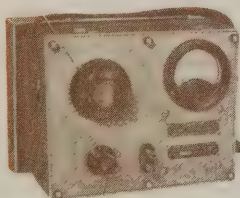
The crystal impedance meter is a test oscillator used in measuring the equivalent electrical parameter of quartz crystals. The following models are available: TS-537/TSM or Lavoie Model 50, 75 to 110 kc. • TS-683/TSM or RFL Model 531, 10 to 140 mc. • TS-710/TSM or RFL Model 541A, 10 to 1100 kc. • TS-330/TSM or RFL Model 459, 1 to 15 mc.



TS-107A/TPM-1 UHF WAVE AND POWER METER

TS-107A/TPM-1 is a portable, self-contained, battery operated instrument designed for the U.S. Navy by Narda Corp. It measures frequency and average power in the range of 500 - 1500 mc.

Specifications: Frequency Range: 500 - 1500 mc. • Frequency Control: Direct Reading Dial. • Power Measuring Range: .5 to 250 mw (-3 to +24 dBm), to 2 watts (+33 dBm). • Accuracy: Frequency ± 3 mc Power ± 1 dB. • Input Impedance: 50 ohms. • Size: 10½" H x 13½" W x 8" D. • Weight: 26 lbs.



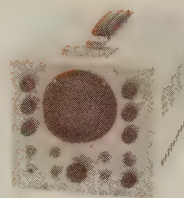
TS-585/U AUDIO FREQUENCY POWER METER

A portable direct reading output meter which indicates audio-frequency (af) power in milliwatts (mw), or in decibels referred to 1 milliwatt in 600 ohms (dbm).

Measures the output of audio amplifiers, filters, oscillators, and similar equipment. It also may be used to

determine the characteristic impedance of equipment under test. A very useful instrument for servicing radio communications equipment.

Specifications: Power ranges — 0.1 to 5 mw, -10 to +7 dbm.; 1 to 50 mw, 0 to +17 dbm.; 10 to 500 mw, +10 to +27 dbm.; 100 to 5,000 mw, +20 to +37 dbm. • Input impedances — 2.5; 3; 4; 5; 6; 8; 10; 12.5; 15; 20; 25; 30; 40; 50; 60; 80; 100; 125; 150; 200; 250; 300; 400; 500; 600; 800; 1,000; 1,250; 1,500; 2,000; 2,500; 3,000; 4,000; 5,000; 6,000; 8,000; 10,000; 12,500; 15,000; 20,000 ohms. • Accuracy (at 11-dbm position): Power $\pm .4$ db • Impedance ± 5 percent. • Frequency range: 30 to 10,000 cycles per second.



TS-1060/GG TELETYPEWRITER TEST SET

A self-contained portable unit that measures the bias and distortion of start — stop and synchronous telegraph signals. Various types of distortion peculiar to teletypewriter equipment can be measured without interrupting service.

Specifications: Input Speeds: 7.42 Unit code: 60, 75, 100 wpm. 10.42 unit code: Baud speeds equivalent to 60, 75 & 100 wpm. 5.0 unit code: 60 wpm (approx.) • Input Signal Current: 60 or 20 ma neutral, 30 ma polar • Input Impedance: 100 ohms for 60 ma neutral, 300 ohms for 20 ma neutral, 300 ohms for 30 ma polar • Range of measurement: 0% to 50% marking, or spacing bias and distortion • Accuracy: $\pm 2\%$ bias. • Indication: Rectangular pattern on 3 inch CRT screen. • Voltage Input: 115 or 230/50 - 60 Hz/1 Ph.



AN/UPM-15 PULSE GENERATOR

Portable equipment used in field and depot maintenance for testing pulse amplifiers and networks, as well as for modulating oscillators. It generates single or double pulses of variable pulse repetition rate, pulse width,

pulse amplitude, and pulse delay. The pulses may also be synchronized with oscillators or other instruments.

Specifications: Power Requirements: 360W, 115V $\pm 10\%$, 50 to 1,600 cy, 1 phase AC. • Type of Emission: Pulse. • Output Impedance: .25 ohm below 20 mv; 2.5 ohms from 20 to 200 mv; 50 ohms from .2 to 2V; 250 ohms from 2 to 20V; 2,500 ohms above 20V. • External Trigger Pulse: 0 to 50,000 pps, 2 to 100V. Pulse Amplitude: .002 to 200V. • Pulse Delay: 2 to 225 usec after the synchronized pulse. • Pulse Repetition Rate: 50 to 10,000 pps int (internally or externally synchronized). • Pulse Rise and Fall Time: .05 to .25 usec. .10 to .3 usec respectively, measured from 10 to 90% amplitude. • Pulse Width: .5 to 100 usec. • Second Pulse: Identical in shape to first pulse and follows first pulse by an interval of 3 to 30 usec. Temperature Range: -40°C to +55°C. Accuracy $\pm 10\%$ of any indication after 10-min warmup, $\pm 5\%$ at 21°C.

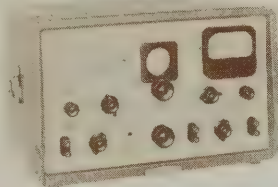
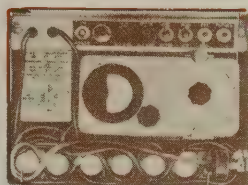


MISCELLANEOUS TEST EQUIPMENT

AN/PRM-10 GRID DIP WAVE METER

The AN/PRM-10 is a rugged, military version of the Measurements Corp. Model 59 Grid Dip Meter. It is a combination wave meter and signal generator.

Specifications: 2 to 400 mc $\pm 2\%$ AM or CW. • Power Requirements: 115/50 - 1000 cps/1 Ph.

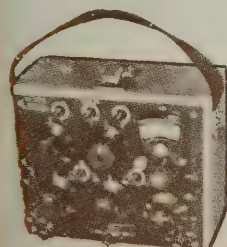


HP 330B • TS-723A/U AF DISTORTION ANALYZER

Used to measure harmonic distortion and noise level in audio frequency amplifiers. Frequency range 20 Hz to 20 kHz. Distortion levels as low as .1% can be measured with accuracy of $\pm 3\%$ of full scale for levels of distortion over .5%. Built-in VTVM for full scale sensitivities of .03 - 300 volts AC in 9 ranges. 10 Hz - 100 Hz VTVM response. The military direct equivalent to the Hewlett-Packard Model 330B is the TS-723A/U. All versions of the TS-723A/U are stocked, including the very latest model, the TS-723D/U.

ME-61/GRC FIELD STRENGTH METER

A portable field strength meter and modulation monitor for use with tactical radio sets, AN/GRC-9, AN/GRC-87, AN/VRC-34, etc. Covers the frequency range of 1.5 - 24 MHz. Total gross weight is only 3 lbs.



ZM-4B/U RESISTANCE BRIDGE

The ZM-4B/U is a portable Wheatstone type resistance bridge used in finding faults in telephone systems. It can also be used to measure the resistance of fixed resistors.

Specifications: Power Requirements: 4.5 VDC internal battery. • Resistance Range: 1 ohm to 10 megohm $\pm 15\%$.

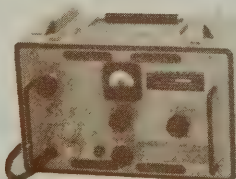
AN/GRM-55 TEST SET FOR AN/PRC-25 & AN/PRC-77

A portable test set designed to make tests at all available test points of AN/PRC-25 radio set and to isolate a failure in a particular module.

TS-251/UP LORAN TEST SET

A portable signal generator used in preflight and test bench checking of long range LORAN receivers.

Specifications: Power Requirements: 22W, 80, 115, or 230V, 50 to 1,600 cy, 1 phase AC. • Frequency Range: 1,700 to 2,010 kc. • Type of Emission: Pulse.



AN/GPM-15 LORAN A & C TEST SET

A compact, portable test generator used in checking of Loran receivers such as AN/APN-4, AN/APN-9, AN/APN-9A, AN/APN-70. The signal generator provides crystal-controlled r-f signals for all standard Loran channels, simulating the normal signals received by the Loran receiver during actual operation and thus allowing a complete functional test to be performed upon the receiver.

Specifications: Crystal Controlled Frequencies: Loran A: 1750, 1850, 1900, 1950 kHz. Loran C: 100, 180 kHz. • Power Input: 115V/50-1000 Hz/1 Ph. • Dimensions: 7" x 12" x 10".



AN/URM-114 RADIO CALIBRATOR SET

Designed to tune a base-tuned antenna covering the frequency range of 2 - 32 MHz, or the antenna system and final amplifier of a TBK, TBL or TBM transmitter. Calibration is provided by the noise technique, an off-the-air silent tuning method which results in improved security and a decrease in interference. This set is used mainly aboard submarines.

WESTERN ELECTRIC 2B TS-559D/FT TRANSMISSION MEASURING SET

A portable battery-operated test set, designed to measure noise on telephone circuits. It is also used for transmission measurements, as a flat amplifier, and as an oscillator. This set is the same as the Western Electric Model 2B or Daven 34 Test Sets.

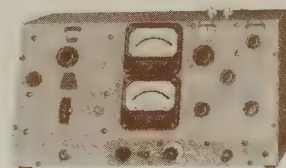
Specifications: Frequency Range: 0 - 10,000 Hz • Measurable noise level: 10 - 18 dB. Monitoring Receiver Unit: Resonant, magnetic type 10,000 ohms at 1000 Hz. • Meter Type: Direct reading, in decibels.



AN/PSM-34 & AN/PSM-35 INSULATION RESISTANCE TEST SETS

These portable, hand-cranked units are the same except for different ohm and voltage ranges. Both are supplied with sturdy carrying cases and test leads.

AN/PSM-34: 0-500V DC 0 - 100 megohms • AN/PSM-35: 0-500V DC DC 0 - 1000 megohms.



HP BOONTON Q & RX METERS

Columbia can supply, from stock, for prompt delivery the following Q and RX meters, recalibrated by factory experts: HP Boonton 190A Q meter. Range: 20 - 260 MHz. • HP Boonton 260A Q Meter. Range: 50 - kHz - 50 MHz. • HP Boonton 250A RX Meter. Range: - 500 Hz - 250 MHz.

I-61D TELEPHONE TEST SET

A portable dry battery operated transmission measuring set used to measure losses or gains in telephone circuits or telephone apparatus. • This set contains an audio oscillator, sending and receiving amplifier and an EE-8 telephone set.

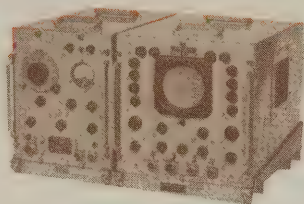




MISCELLANEOUS TEST EQUIPMENT

AN/WQM-4 SONAR TEST SET

Provides an accurate means of testing various Navy Sonar Equipment in order to maintain it at its optimum operating efficiency. This set acts as a known source of sonic energy at any frequency between 160 Hz and 160 kHz for checking sonar system receiving circuits. Set is also capable of receiving and displaying a sonic signal for checking sonar system transmitting circuits. The following functions of a sonar system can be tested by this unit: Receiving Sensitivity, Minimum Detectable Pressure or threshold echo level, Self-Noise of the System, Intensity of the transmitted signal, Frequency, and Accuracy or range indication.



SINGER STODDART NOISE AND FIELD INTENSITY METERS

Columbia can supply from stock most RFI meters manufactured by Stoddart Aircraft Radio Corp. All units are factory checked for calibration and are in excellent-to-like-new condition. All standard accessories are available. Models available: NM-10A or AN/URM-6 14-250 kc. • NM-20A or AN/PRM-1A 150 kc to 25 mc. • NM-30A or AN/URM-47 20 to 400 mc. • NM-50A or AN/URM-17 375 to 1000 mc. • NM-52A 375 - 1000 mc.

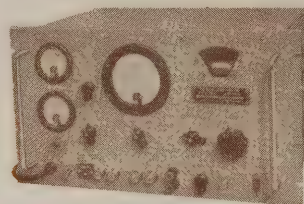
EMPIRE & SINGER NOISE AND FIELD INTENSITY METERS

Columbia can supply factory recalibrated Empire & Singer RFI meters, plug-in tuners and accessories. We stock the following systems, among others: NF-105 14 kHz to 1 GHz, NF-112 1 GHz to 22 GHz.



AN/URM-113A RADIO TEST SET

A portable test set designed to test AN/PRC-8, -8A, -9, -9A, -10 & -10A Radio Set plug-in AM-427/U & AM-427A IF amplifiers, 0-325/U pulse-sweep generator, TF-132/U, and TF-204/U discriminator transformers. This set is self-contained, rapidly tests above plug-ins under simulated operating conditions without the use of the radio sets that they fit into. Power Requirements: 110V/50 - 400 Hz/1 Ph.



ME-57/U FM MODULATION METER

The ME-57/U determines the accuracy of FM deviation of FM signal generators, and FM transmitters. The ME-57/U rapidly measures deviation over a range from 0 - 1000 kc at radio frequencies from 20 to 1000 mc. The modulation frequency may be from 50 - 70,000 cps. This equipment operates from 115 or 230V/50 - 420 cps/1 Ph. This set was designed to be used with all signal corps FM transmitters including, among others, the following systems: AN/VRC-12, AN/PRC-25, AN/GRC-3 to 8, AN/PRC-8, -9 and -10, AN/PRC-77.

IMPORTANT NOTICE ABOUT RECALIBRATION

All test equipment can be supplied with a Certificate of Calibration issued by a licensed standards laboratory evidencing tracibility of calibration to the U.S. National Bureau of Standards.



HEADSETS

HS-33 HEADSET 600 OHMS

A 600 ohm low impedance, flat response 200 to 400 cps, headset with a leather covered fully adjustable HB-7 headband and MC-162-A rubber ear cushion for comfort. Complete with 18" long side mounted cord with PL-354 plug and two ANB-H-1 Receiver Units. HS-33A Headset, same as HS-33 but has large-chamoise lined ear cushions for extra comfort and noise reduction.



HS-23 HEADSET 4000 OHMS

A 4000 ohm HI Impedance Headset. This headset is identical to the HS-33 except for its impedance.



H-158/AIC HEADSET 600 OHMS

Same as H-157/AIC except it has no microphone. See Page 51 for specifications.

H-113/U HEADSET 600 OHMS

A rugged, lightweight, headset which has 2 submersion-proof earphones with comfortable, ear-enclosing vinyl cushions; adjustable vinyl covered headband is compact and offset for under helmet use. 18", single side neoprene covered cordset is terminated with a PJ-054 Plug.



H-140B/U HEADSET 500 OHMS

A rugged, lightweight 500 ohm impedance headset, terminated in an U-229/U connector. This headset is used with the latest Army radio sets.



OTHER HEADSETS AVAILABLE

H-70/AIC Aircraft Type H-78/AIC less mike • CW-49507 Navy type 600 ohms • H-16/U Army type 8000 ohms • H-65/U Army type 8000 ohms • H-216/U Army type 8000 ohms.



HEADSET-MICROPHONE COMBINATIONS

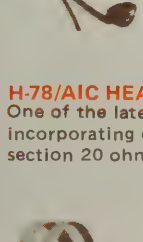
W.E. TYPE 52 TELEPHONE OPERATORS SET

A lightweight combination set which leaves the hands free. Fully adjustable for all head sizes; extended range, replaceable receiver, and replaceable quiet, all-position microphone. Interchangeable with WE52. Has 4' braid covered cord terminated in WE-289 plug. Spec: 600 OHm earphone 100 ohm carbon microphone.



W.E. TYPE 53 TELEPHONE OPERATORS SET

A telephone operator's combination headset that can be hand held by removing the headband. same electrical specifications as W.E type 52.



H-78/AIC HEADSET MICROPHONE

One of the latest type aircraft headset microphones incorporating dynamic microphone. Earphone section 20 ohms, microphone 10 ohms.



H-46A/UR HEADSET MICROPHONE

A complete HS-33 600 ohm headset with a M-3/U 100 ohm carbon microphone attached, with a swivel bracket.



H-63/U HEADSET MICROPHONE

A fully adjustable headset with a boom microphone fastened to headset with snaps. Can be snapped off headband when desired. Headset is 600 ohm low impedance magnetic type. Microphone is 100 ohm carbon type.

H-157/AIC HEADSET-MICROPHONE

The latest military, lightweight headset - microphone. Features sturdy construction, comfort and excellent noise reduction achieved by special plastic earcups. This unit is electrically interchangeable with the H-78/AIC.

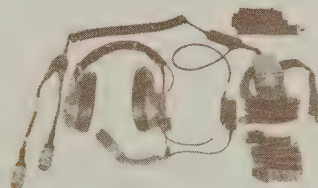
Specifications: Earphone Impedance: 20 ohms.

• Microphone Impedance: 10 ohms. • The H-157/AIC can also be supplied with a carbon noise-cancelling microphone, on special order.



H-200/U SOUND POWERED HEAD-CHEST SET

The H-200/U is designed for shipboard use and requires no external source of power. This unit is supplied with a 20 foot long cord and standard Navy 5-7422 plug. Specially designed or modified units are available. Write for quotations for all your maritime and telephone and switching requirements.



H-161C/U DYNAMIC HEADSET-MICROPHONE

Designed for use with the latest Army FM radio sets. Includes chest-mounted press-to-talk switch, and coil cord terminated into two U-229/U connectors, 500 ohm earphone, and 150 ohm microphone.

OTHER MODELS AVAILABLE

H-81/U Headset-Microphone • H-101A/U Headset-Microphone
• H-108/U Headset-Microphone • H-144/U Headset-Microphone
H-154/AIC Headset-Microphone • H-161/U Headset-Microphone
MK-525/G Headset-Microphone • MK-526/G Headset-Microphone.



HANDSETS

H-203/U SOUND POWERED HANDSET

A sturdy handset designed for shipboard use. Can be supplied with or without press-to-talk switch, and choice of cable and connector, on special order.



H-189/GR DYNAMIC HANDSET

A sturdy, reliable handset with a push-to-talk switch, 500 ohm earphone and 150 ohm microphone, coil-cord terminated in a U-229/U connector.

H-33E/PT AND H-33F/PT HANDSETS

Available with straight or coiled 5 ft. long cord and U-161/U plug, (E or F version). Both are submersionproof, shock-resistant, and have press-to-talk switch. Carbon microphone and 600 ohm receiver. H-33F/PT supplied with retractable coil cord.



OTHER HANDSETS AVAILABLE

TS-9 • TS-10 • TS-11 • TS-13 • TS-15 • H-22/U • H-23/U
H-94/U • H-207/U • W.E. Type F-3 • W.E. Type G-1



MICROPHONES

ELECTRO-VOICE CARBON MICROPHONE

The Model 205-STCKKP is a FAA approved noise cancelling differential carbon microphone with excellent noise cancelling characteristics. Widely used aboard all types of commercial and private aircraft. Supplied with coil cord, PJ-068 plug and mounting bracket.



M-85/U CARBON MICROPHONE

The M-85/U is a hand-held, push-to-talk carbon microphone suited for general purpose use. Ideal for users requiring a sturdy, lightweight, microphone with retractable cord with PJ-068 plug.



RS-38A & M-85/U

TELEPHONICS RS-38A

RS-38A CARBON MICROPHONE

A compact press-to-talk 100 ohm carbon hand microphone. Complete with 5 foot straight cord and PL-68 plug.

M-80C/U DYNAMIC MICROPHONE

A sturdy hand-held, 150 ohm microphone with coil cord terminated in a U-229/U connector. Designed to be used with the latest Army FM radio sets, including AN/VRC-12.



M-29B/U & M-52/U NOISE CANCELING CARBON MICROPHONES

A hand-held microphone widely used with radio and intercom in noisy locations. Both feature a press-to-talk switch. M-29B/U, a five conductor, retractable cord type, terminated in a U-161 plug. The M-52/U is equipped with a straight cord terminated in a PJ-068 plug.

OTHER MICROPHONES

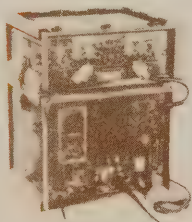
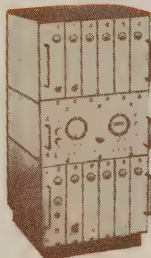
M-3A/U Boom Mike • M-6A/UR Mike Button • M-15/UR Hand Mike • M-32C/AIC Mask Mike • M-33/AIC Boom Mike • M-87/AIC Boom Dynamic Mike • M-94A/A Mask Dynamic Mike • M-116/G Dynamic Mike.



MULTIPLEX & TELEPHONE TERMINAL EQUIPMENT

AN/UGC-1 MULTIPLEX TELETYPE TERMINAL

Manufactured by the Teletype Corp. for the U.S. Navy. It is a compact, transistorized terminal that can accommodate up to four sending and up to four receiving teletype circuits on a single RF channel. This equipment is standard on all U.S. Naval ships and at shore stations.



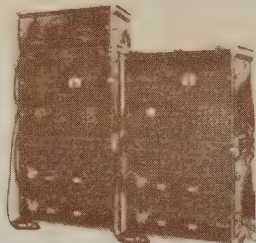
AN/TCC-3 TELEPHONE TERMINAL

A four channel carrier telephone terminal set used to provide four voice frequency channels and one order-wire channel over loaded spiral-four cable or radio. It can also be used to carry a single wide-band special-service channel.

AN/TCC-4 TELEGRAPH TERMINAL

Used for high speed, frequency-shift, voice-frequency, carrier telegraph communications. It provides terminal equipment for eight Teletypewriter channels over a standard two or four wire telephone facility, or 16 channels over a four-wire facility. Different arrangements of this equipment can be made to provide for more or less telegraph channels.

- This equipment consists essentially of two telegraph terminals AN/TCC-20 plus one Telegraph Modem TH-14/T.

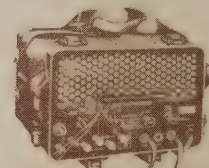
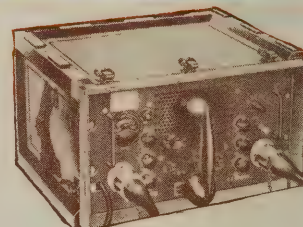


OTHER TELEPHONE AND TELEGRAPH TERMINAL EQUIPMENT ALSO AVAILABLE

AN/TCC-7 Telephone Terminal 12 voice frequency channels.
AN/TCC-8 Telephone Repeater 12 voice frequency channels.
AN/TCC-11 Telephone Repeater 12 voice frequency channels.
AN/TCC-20 Telegraph Terminal 4 voice frequency channels.
Tell us your requirements. Columbia can supply all standard military and commercial model terminal sets.

AN/TCC-5 TELEPHONE REPEATER

A four wire carrier telephone repeater designed to be used at intermediate points of a system terminated by the AN/TCC-3 telephone terminal.



AN/TCC-14 TELEGRAPH-TELEPHONE TERMINAL GROUP

Specifications: Terminal AN/TCC-14 is portable equipment used to transmit speech and telegraph pulses, simultaneously, through telephone facilities. Telephone and telegraph circuits in the equipment are completely independent of each other and are controlled separately. The terminal does not require a direct current telegraph switchboard since its voice-frequency telegraph loops may be switched through existent telephone switchboards and the signal transmitted as a voice-frequency-shift signal. This terminal may be used in point-to-point, network, switched and remote control radio systems. When used in a 2-wire facility, speech plus half-duplex telegraph or teletypewriter operation may be obtained; when used in a 4-wire facility, full-duplex telegraph or teletypewriter operation can be obtained if desired.

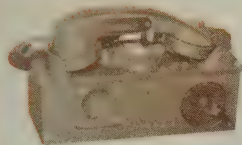
AN/TCC-70 MULTIPLEXER SET

A lightweight, solid state tactical frequency division multiplexer set. Provides four telephone channels of either voice or data transmission, one order-wire channel, and a maximum of four telegraph channels. This set supercedes the AN/TCC-3 and -20 multiplexer sets and is used with standard Army tactical radio sets. It is compatible with TH-5/TG, TH-22/TG or TH-85/GCC Telegraph Terminals. Additional units can be combined to provide extra channels.





TELEPHONES



TA-312/PT MAGNETO FIELD TELEPHONE

A local or common battery, rugged field telephone supplied with protective canvas carrying case (not shown). This telephone replaces the EE-8.

CROUSE-HINDS • AUTOMATIC ELECTRIC WALL TELEPHONE FOR HAZARDOUS LOCATIONS

A wall-type, common-battery telephone for locations subject to possible explosion hazards. These units are so constructed, that the electrical portions, which sometimes emit sparks during operation, are enclosed in a specially designed protective metal housing. Available with or without dial.



TA-1/PT SOUND POWER TELEPHONE HANDSET

This handset has a built-in magneto ringing generator and sounding clapper. Supplied with plastic carrying case (not shown). This unit replaces the TS-10 sound powered handset.

EE-8 MAGNETO FIELD TELEPHONE

A very rugged, magneto type field telephone that has been popular ever since World War II.



TELEPHONE SWITCHBOARDS

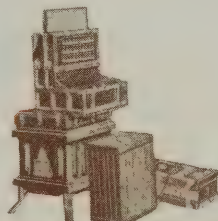


SB-22/PT TELEPHONE SWITCHBOARD

A very compact portable 12 line Monocord type field switchboard. Two of these units can be stacked and used together to provide 29 lines.

SB-86/P PORTABLE MANUAL SWITCHBOARD

Portable Switchboard is used to connect local-battery telephone and voice frequency teletypewriter lines in many types of wire communication systems. This switchboard is capable of handling 15 calls at a time. Provision is made for automatic and manual ringing, common-battery and magneto signaling, and conference calls.



SB-3082(V)1/GT CORDLESS MANUAL TELEPHONE PORTABLE SWITCHBOARD

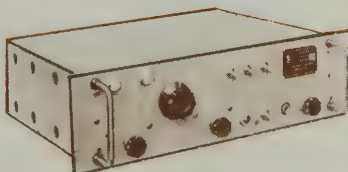
This is the U.S. Army's latest, most advanced tactical switchboards designed to replace the SB-86/P. This 2-wire, 50-termination switchboard provides a variety of terminal functions to accommodate different user requirements. Please write for complete specifications.



SSB & ISB RECEIVING CONVERTERS

TMC MODEL MSR-4 SSB ADAPTER

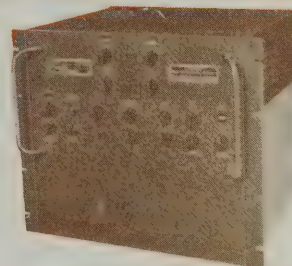
The Technical Materiel Corp. MSR Series SSB Adapters are IF type adapters that provide SSB reception with many conventional receivers such as the R-388/URR, R-390A/URR and SP-600 Etc. Provisions for the selection of upper or lower sidebands as well as the capability of demodulating AM, CW, MCW and FSK signals. Simultaneous reception of upper and lower sideband information is possible by the use of two MSR's with a single receiver.



CV-157/URR SSB & ISB CONVERTER

Designed by Hoffman Labs for the U.S. Army. A compact, very reliable IF type SSB converter with automatic gain and frequency controls. This converter will handle: 12 Radio Teletype Channels or 6 Radio Teletype Channels and a simultaneous voice order channel; or 2 voice channels or 2 channels of facsimile. This unit can be used with the R-390A/URR or equivalent receiver.

Specifications: Input Frequency: 450 - 510 Kc. • Converter IF Center Frequency: 100 Kc. • Number of Channels: Input 1, Output 2. • Frequency Control: Automatic Circuit Built-in. • Power Requirements: 115V/50-60 cps/1 Ph.



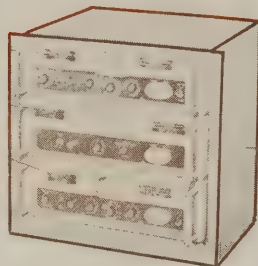


TELETYPE TERMINAL EQUIPMENT

AN/URA-8 FREQUENCY SHIFT CONVERTER-COMPARATOR GROUP

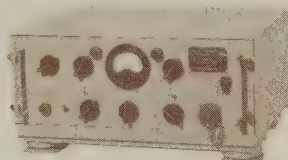
A dual diversity unit designed for the U.S. Navy for shipboard and shore use. This equipment accepts audio signals from two receivers and selects the strongest signal from either receiver to control the keying of the teletypewriter. Either of the two frequency shift converters can be used as a separate unit if dual diversity is not required.

Specifications: Signal Input: one narrow-shift and one wide-shift. • Input Level: .06 to 5 mw - (600 ohms). • Width of Shift: Narrow 10 - 200 cps, wide 200 - 1000 cps. • Keying Speed: 60 or 100 wpm. • Teletypewriter Output: 60 ma at 70 VDC. Power Requirements: 115V/50 - 60 cps/1 Ph. • Major Components: CV-89/URA-8 Frequency Shift Converter (2 each) • CM-22/URA-8 Comparator. • MT-719/URA-8 Mounting Rack.



AN/SGC-1 FREQUENCY SHIFT TONE KEYS & CONVERTER

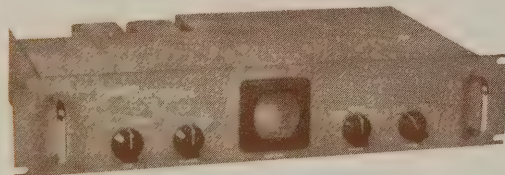
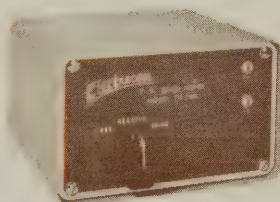
Widely used aboard all types of Naval ships in conjunction with standard Naval VHF and UHF transmitters and receivers as an audio tone shift teletype terminal. These units are very popular because of their compact size and durability.



ELECTROCOM TK-100 FREQUENCY SHIFT TONE KEYS

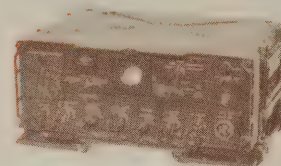
A self-contained, solid-state audio tone oscillator that may be keyed by current input or contact closure to either of two tone frequencies. These keyed tones are suitable for feeding into audio amplifiers of SSB AM or FM transmitters or over telephone lines for

transmitting Audio Frequency Shift (AFSK) teletypewriter, data, or control signals. Also suitable for use with high suppression (50 dB or greater) single sideband suppressed carrier transmitters for generating frequency shift (FSK) signals. Provision is incorporated for CW keying of either tone, primarily for identification purposes.



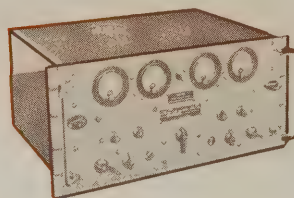
ELECTROCOM FSC-250 FREQUENCY-SHIFT CONVERTER

A highly versatile complete terminal unit for outstanding radio-teletype performance. By the use of plug-in filters, most frequency shifts can be obtained. Has scope tuning indicator for rapid accurate receiver tuning. Audio filter system may be used for FSK and Audio FSK operation. Engineered and quality constructed for long years of troublefree service. Can be used with any type communications receiver. Solid-state model also available.



MD-522A/GRC RADIO TELETYPEWRITER MODEM

A solid-state, radio teletype converter designed by General Dynamics primarily for use with the AN/GRC-106 radio set. This modem permits transmission and/or reception of teletype data. Modes of operation include: frequency shift keying, narrow shift keying, voice only, frequency diversity, plus voice. Types of operation provided are: one-way reversible transmission and reception, and simultaneous transmission-reception. This modem is a major component of several Army Radio Sets: AN/GRC-122, AN/GRC-142 and AN/VSC-2.

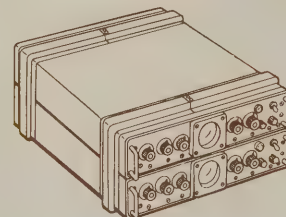


CV-116/URR FREQUENCY SHIFT CONVERTER

Dual diversity FSK Converter was designed by Hoffman Radio Labs for the U.S. Army. It operates from the IF Outputs of two R-390/URR Radio Receivers or similar equipment. Frequency control

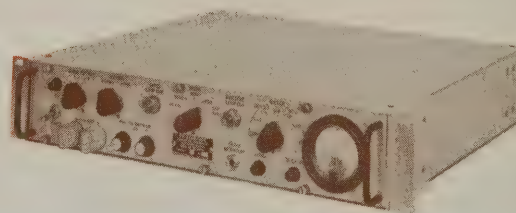
of this converter unit is accomplished by a crystal or by an automatic frequency control circuit in the local-oscillator.

Specifications: Input Frequency: 450 to 510 kc. • Frequency-Shift Range: 150 to 1000 cps. • Output Signal: Mark 60 MA, Space 0 MA. • Keying Speed: 100 Dot CPS. • Power Requirements: 115V/50 - 60 cps/1 Ph.



AN/URA-17 DUAL-DIVERSITY TELETYPE TERMINAL

One of the Navy's most advanced solid-state FSK terminals designed for dual-diversity use. Consists of two identical CV-483/URA-17 frequency shift converters that can be used independently as each one is self-contained. A built-in 2" CRT display facilitates tuning. **Specifications:** AF Input Signal: 600 ohm. • Operating Frequencies: 10 - 1000 Hz shift. • Output: 60 MA for DC Loop Circuit. • Power Requirements: 110/50 - 400 Hz/1 Ph. • Also available AN/URA-17B Teletype Terminal.



CV-2460/SGC TELEGRAPH TELEPHONE SIGNAL CONVERTER

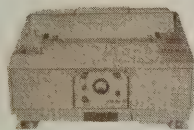
A solid state AFSK teletype converter designed to replace the AN/SGC-1 long used by the U.S. Navy. Provides a switch for selecting wideband ± 425 Hz, or narrowband ± 100 Hz • FSK data transmitted over a radio circuit. Send-only, receive-only, half or full-duplex operation is selected by front-panel switch.



FACSIMILE EQUIPMENT

RD-92/UX FACSIMILE RECORDER

Designed to record the signals transmitted by the AN/TXC-1 facsimile transceiver. It is used for direct stylus recording. When receiving copy the drum rotates at a speed of 60 RPM.

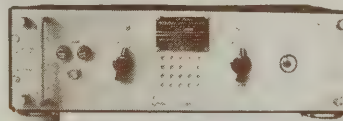
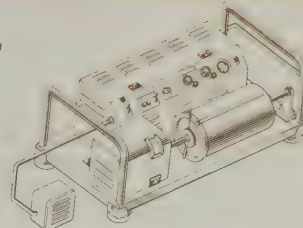


AN/UXH-2 FACSIMILE RECORDER

A continuous page fax recorder designed to record a succession of weather maps or other data. This recorder is one of the most advanced sets in use by the U.S. Navy. It uses the direct stylus method of recording on 18½ inch wide dry paper.

AN/TXC-1 FACSIMILE TRANSCEIVER

An electromechanical-optical facsimile set of the revolving-drum type for transmission and reception of page copy. Received copy is recorded either directly on chemically treated paper or photographically in either negative or positive form. The equipment transmits or receives a page of copy 12 to 18 inches in 20 minutes at regular speed of 60 RPM.

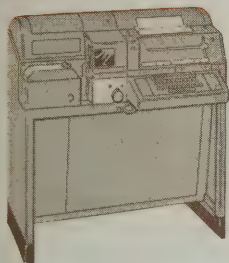


CV-172/U FREQUENCY SHIFT FACSIMILE CONVERTER

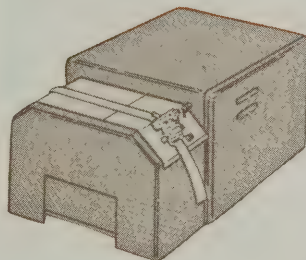
Manufactured by Times Facsimile. Converts 1500 and 2300 cps A.F. frequency-shift facsimile signals to AM signals for a facsimile recorder such as the RD-92/UX or others.



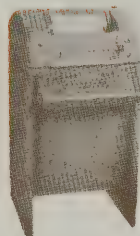
TELETYPEWRITER SETS



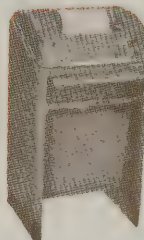
28 ASR



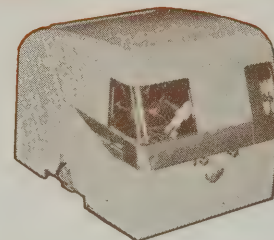
28 TAPE READER/TRANSMITTER



28KSR
WITH KEYBOARD



28RO
LESS KEYBOARD



28 TAPE PERFORATOR/PERFORATOR
LESS KEYBOARD



28 TAPE PERFORATOR/PERFORATOR
WITH KEYBOARD

MODEL 28 TELETYPEWRITER SETS

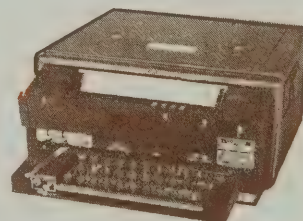
A heavy duty line of teletypewriters that uses a five-level code for message transmission and reception. They operate at speeds up to 100 words per minute. Transmission mode may be half or full duplex and the signal line interface is direct current. They are offered with 50 or 60 Hz synchronous motors or 50/60 Hz series governed motors. Some available configurations include:

- Receive-only (RO) set - receives information as printed page copy, no keyboard.
- Keyboard send-receive (KSR) set - provides transmission from keyboard and printed page copy either locally from keyboard or from received electrical signals.
- Automatic send-receive (ASR) set - provides transmission from keyboard, printed page copy and paper tape punch and reader.
- Tape perforator and reperforator set. Options: With or without keyboard, typing or non typing.
- Tape transmitter reader.

Contact us for competitive quotations on factory rebuilt, like new Model 28 series teletype equipment tailored to your requirements, with your choice of options. New spare parts also available from stock. Columbia can also supply model 14, 15, 19, 32, 33, 35 and 37 Series Teletype Equipment.

AN/TGC-14A(V) • TT-298A/UG • TT-299A/UG • AN/UGC-41 MITE CORP. TELETYPEWRITERS

The TT-298A/UG and TT-299A/UG are the same except that the TT-299A/UG comes equipped with a plug-in keyboard. The units were designed for the U.S. Navy and Marine Corps. They are miniaturized, lightweight, and designed for rugged military service. These units are compatible with Teletype Corp. Models 14, 15, 19 and 28.

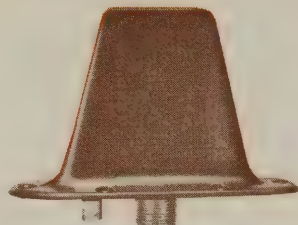




MILITARY ANTENNAS

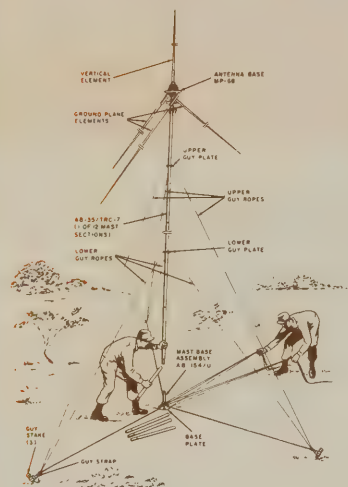
AT-741/A TACAN IFF ANTENNA ANTENNA

This airborne antenna covers the frequency range of 960 - 1220 MHz and is ideal for all types of aircraft.



AS-1201/BPX UHF & IFF SUBMARINE ANTENNA

A combination antenna designed for installation on submarines. Frequency Range: 225-400 MHz and 960-1050 MHz.



RC-292 VHF ANTENNA KIT

A ground plane antenna system for use with all Army tactical radio sets in the frequency range of 20 to 76 MHz. Supplied with sectional 35 ft. mast and all items necessary for erection in the field. When disassembled, it stores into a canvas bag.



AT-1011/U 32 FT FIBERGLASS WHIP ANTENNA WITH BASE

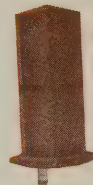
A versatile, self-supporting fiberglass antenna consisting of 8 each, 4 ft. sections primarily intended for mobile or stationary use. Usually, only four sections, extending 16 feet are used on vehicles in motion. A heavy duty base is also part of this system. Write for complete information and choice of optional mounting bases. Columbia can also supply a wide range of fiberglass self-supporting whip antennas for stationary and marine applications.

AIRCRAFT ANTENNAS AIRCRAFT BLADE TYPE ANTENNAS

AN-104B 100 - 156 mc • AT-141/ARC Blade Type 225 - 400 mc
• AT-145B/A Blade Type 116-260 mc • AT-1076/A
Blade Type 225-400 mc

COLLINS 37R-2U • AT-1108/ARC VHF & UHF ANTENNA

This vertically polarized antenna combines both VHF and UHF antennas in a single unit. Especially suited for all types of military aircraft. Frequency Range VHF: 116 - 152 MHz. *UHF: 225 - 400 MHz.



AT-256A/ARC UHF ANTENNA

A popular antenna covering the frequency range of 225 - 400 MHz. Ideal for most aircraft.

AS-177A/UPX IFF ANTENNA

A standard shipboard IFF Antenna operating in the 1010 to 1110 MHz Frequency Range. Has a built-in filter to attenuate frequencies above 1200 MHz.



AS-1097B/GR UHF HI GAIN ANTENNA

A four-bay stack of vertically polarized elements covering the frequency range of 225 - 400 MHz. The height of this antenna is 10 ft., which extends to 15 ft. with a 5 ft. support. The gain of this antenna is plus 4 dB with respect to the half wave dipole. The housing is fiberglass and a provision is made for warning lights and lightning arrestor. (Not included). Total Weight is only 50 lbs.

NAVY HF WHIP ANTENNAS

Types 66046 • 66047 • 66053 — These stainless steel HF Communications Antennas are used on all classes of ships. They are supplied with insulated antenna bases.

Specifications:

Type	Length	Weight
66046	28 ft.	42 lbs.
66047	35 ft.	50 lbs.
66053	25 ft.	40 lbs.

AS-2537A/SR, 35 FT. FIBERGLASS WHIP ANTENNA

An epoxy fiber glass two-section whip antenna designed for general purpose shipboard use. The base insulator is an integral part of the antenna capable of being bolted directly to the mounting surface. Antenna withstands winds of over 100 mph and ice loading with minimum deflection. Frequency range: 2-30 MHz.

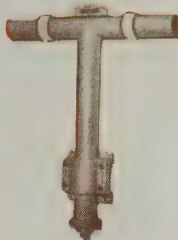




MILITARY UHF ANTENNAS

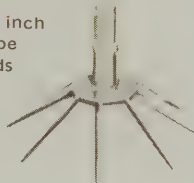
AT-150/SRC 225-400 MHz DIPOLE ANTENNA

A pressurized dipole antenna, constructed of 2 1/4" aluminum tubing and designed to withstand 50 lbs per square inch pressure. Impedance: 52 ohms. • VSWR: under 2.1:1 Type "N" connector. • Approximate Weight: 7 lbs. • Dimensions: 17-5/8" across dipole. • Height: 22-5/8".



AS-390A/SRC 225-400 MHz UHF COAX-STUB ANTENNA

A vertically polarized coaxial stub with 2 1/4" diameter tubular elements. Ground plane rods are angled 37 degrees for optimum radiating pattern. Pressurized to withstand 50 lbs. per square inch. • Impedance: 52 ohms. • VSWR: under 2.0:1 Type "N" connector. • Diameter across ground plane rods 23", height: 16".



AT-197/GR 225-400 MHz UHF DISCONE UHF ANTENNA

A vertically polarized discone antenna of aluminum construction. Power rating: 1 kw. • Radiation pattern: circular with 0.5 dB. • Impedance: 50 ohms. • VSWR: 1.6:1 maximum. • This antenna weighs 6 lbs. has a maximum diameter of 19" and a height of 27".



AS-505/GR 225-400 MHz UHF FOUR BAY COLINEAR ANTENNA

A vertically polarized omnidirectional colinear antenna mounted on a ten foot long tubular mast. The entire antenna is of welded aluminum construction. Power Rating: 1 kw. • Gain: greater than 4 dB over halfwave dipole measured at peak of main beam. Impedance: 50 ohms. • VSWR: under 2:1 • Beamwidth: 12 degrees at 400 mc increasing to 20 degrees at 225 mc.



METEOROLOGICAL EQUIPMENT



AN/GMD-1 RAWIN SET

A transportable radio direction finder that automatically tracks a balloon-borne radiosonde transmitter. The emitted signal contains meteorological information in the form of audio modulation or audio frequency pulse-rate modulation, which is received, amplified, and detected by this equipment. By reference to calibration data for the radiosonde, these audio frequencies are converted to values of temperature, humidity, and pressure.

Specifications: Frequency Range: 1660 to 1700 mc • Type Reception: AM of FM • Receiver type: Superheterodyne • IF Frequency: 30 mc • Frequency Control: automatic and manual.

AN/TMQ-5 RADIOSONDE RECORDER

The AN/TMQ-5 measures and records on a chart radiosonde data as received by a radiosonde receiving system such as Rawin Set AN/GMD-1. This equipment is standard at most military and civilian ground meteorological stations in the U.S.



METEOROLOGICAL BALLOONS

Columbia can supply factory new ceiling, pilot and sounding neoprene balloons. Available for prompt delivery in a wide range of sizes and colors. Write for more information.

CALCIUM HYDRIDE CHARGES • HYDROGEN GAS GENERATORS

All standard size calcium hydride charges are available for prompt delivery. These charges generate hydrogen gas when immersed in water to inflate meteorological balloons. The following are widely used: ML-304A/TM for a 30 gram balloon, ML-305A/TM for a 100 gram balloon. These units can be used in multiples for larger balloons.



PROTECTIVE HELMETS

PROTECTIVE HELMETS FOR FLIGHT AND GROUND SUPPORT & OXYGEN MASKS.

Columbia can supply all popular U.S. Military Pilots' protective helmets manufactured in accordance with latest military specifications. Available with your choice of audio equipment, in all popular sizes. A few of the models available are: HGU-2A/P Flying Helmet U.S.A.F. • HGU-26/P Flying Helmet U.S.A.F. • APH-5/A Flying Helmet Army • APH-6/A Flying Helmet Navy • APH-6/D Flying Helmet Navy. Oxygen Masks & Accessories: We also can supply pilots' oxygen masks and accessories such as: MBU-5/P Pressure Breathing Demand Mask • MBU-4/P Demand Mask. • A-8B Constant Flow Mask. Write for quotations



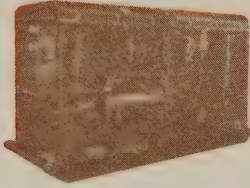
CVC & AVC PROTECTIVE HELMETS

Protective Helmet for combat vehicle crewmen, usually supplied with the MK-1039/G Dynamic Headset Microphone installed for use with the latest U.S. Army vehicular radio sets and intercommunications systems. Also available with the MK-525/G or MK-526/G Headset-Carbon-Microphone to operate with older Army Radio Sets. AVC Protective Helmets supersede the CVC Helmets. They have superior specifications. Please write for more information.





AC POWER GENERATING EQUIPMENT

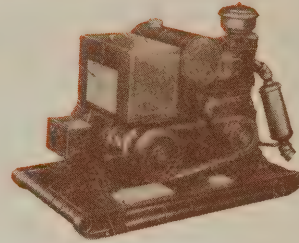
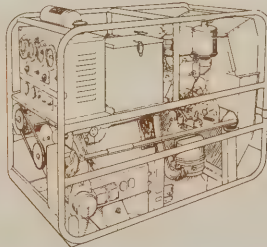


PE-95 10 KW 120/240 VAC POWER PLANT

The PE-95 are complete, self-contained, transportable, Electric Generating Sets consisting of a 4-cylinder, 4-cycle, L-head, water cooled, electric starting 35 hp Willys Overland Model JP-441 or MB-441 Gasoline Engine directly connected to a 10 kw AC Generator of the revolving field, self excited type. The PE-95 has a control panel mounted at one end of the unit on which all necessary meters, terminals and controls are mounted. All models of PE-95 are available including spares.

PU-286/G 5 KW GENERATOR SET

A portable generator set powered by a four-cylinder Hercules gasoline engine. It is intended primarily to power electronic equipment and other military equipment. Power Output: 120V/60 Hz/ 1 Ph.



PE-75 2500W AC POWER PLANT

The PE-75 is a self-contained compact portable, gasoline-engine-driven power plant. The AC generator is belt coupled. The engine used is a Briggs and Stratton single cylinder, 4 cycle air cooled engine, for which parts are available world wide through Briggs and Stratton distributors. This unit has many uses and is thoroughly reliable. **Specifications:** Operating speed: 1800 RPM • HP: 6.5 at 2400 RPM • Start: Rope • Type Generator: Self-excited • Gen. Output: 2500 W, 120 VAC, 22 amp, 1 Ph., 60 cps • Power Factor: 100% • Net Weight: 350 lbs. • Dimensions: 36" L x 20" W x 26" H. • All models of PE-75 are available including spare parts.

Columbia can supply new spare parts for the following power plants: PE-75, PE-95, PU-26A/U, PU-58/G, PU-107/U, PU-286/G, PU-211/G, E-3, HC-30W-400, N-15, all models made by O'Keefe & Merritt and Hercules Electric Machinery Corp. as well as many more. Send us your inquiries.

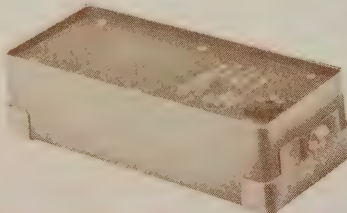
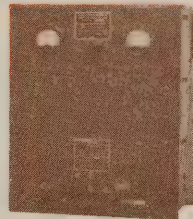


DC POWER SUPPLIES & ACCESSORIES

PP-1104C/G POWER SUPPLY

A general purpose, low voltage DC power source ideally suited to power radio equipment.

Specifications: Power Input: 115 or 230V 60 Hz/1 Ph. • Power Output: Variable from 11.5 - 17.5 VDC at 100A or 23 - 35 VDC at 50A. • Ripple Voltage: .9% rms. • Regulation: 6% at 14V or 4% at 28V. • Dimensions: 24" H x 20" W x 13" D. • Weight: 152 lbs.

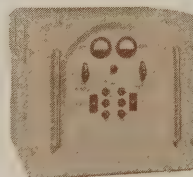


SEALED NICKEL CADMIUM RECHARGEABLE BATTERY FOR AN/PRC-25 AND AN/PRC-77 RADIO SETS

Columbia can supply for prompt delivery rechargeable nickel cadmium battery packs which are a direct mechanical and electrical replacement for the original dry batteries. Also available is a battery charger that provides a regulated charging rate for up to 5 batteries which is suited to the condition of the individual battery packs to be charged. Please write for more information and quantity price quotations.

PP-388/U DC POWER SUPPLY

A very rugged general purpose power supply designed for the U.S. Navy. This unit has a DC output of either 12 V at 38 A or 24 V at 19A from inputs of either 115 or 230 V/ 60 Hz/1 Ph. Has coarse and fine voltage controls on front panel. Makes an ideal source of DC power for all applications, including bench testing of all types of radio communications equipment.



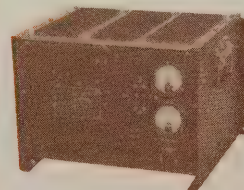
PP-2953/U DC POWER SUPPLY

A solid-state regulated power supply designed to provide DC power to the AN/VRC-12 and AN/VRC-43 thru 49 radio sets when they are to be powered from an AC power source. Power Input: 115 or 220V/1 Ph/50 to 400 Hz • Power Output: 22-27 VDC. @ 10 amps • Dimensions: 6-½ in. H x 14 in. W x 14-½ in. D. • Weight: 40 lbs.



PP-4763A/GRC DC POWER SUPPLY

A solid-state regulated power supply designed to power transistorized military radio sets such as the AN/GRC-106, etc. Power Input: 115 or 230V/47 - 63 Hz/1 Ph. • Power Output: 28VDC at 50A continuous. • Ripple Voltage: 1% RMS. • Voltage Regulation: ±.5%. • Dimensions: 13½" H x 19½" W x 15¼" D. Weight: 125 lbs.



CN-154/U 4 KVA AUTOMATIC LINE VOLTAGE REGULATOR

Made for the U.S. Navy by Superior Electric Co. these heavy duty units are ideal for situations requiring a fully adjustable source of stable AC power. Upper and lower limit controls are mounted on the front panel along with a circuit breaker and large monitoring meter. Voltage control is accomplished by means of a voltage sensitive servo-control motor driven variable transformer.

Specifications: Input: 95 - 135V/ 60 Hz/1 Ph. • Output: 110 - 120V/ 60 Hz/1 Ph. • Dimensions: 12" W x 14" D x 32" H • Weight: 160 lbs.

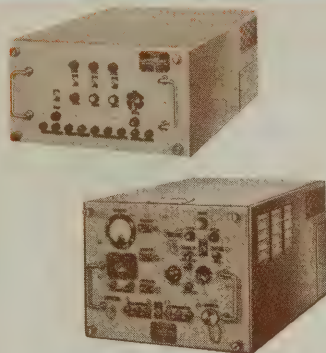




IFF & TRANSPONDERS & ACCESSORIES

AN/UPX-1 RADAR RECOGNITION SET

The AN/UPX-1 is used aboard Naval Ships chiefly for challenging unidentified radar targets. This set consists of four major units: Receiver-Transmitter, Coder-Decoder, Video Amplifier and a Radar Set Control. Frequency Range: 990 - 1040 mc.



AN/UPX-5 • AN/UPX-12 RADAR IDENTIFICATION SET

A Mark 10 type IFF Identification set manufactured by General Electric Co. for the U.S. Navy. This equipment is widely used on all types of U.S. Naval Ships. The AN/UPX-12 is a modified AN/UPX-5. The modification kit increases the capabilities of the AN/UPX-5 so much that it was renominclatured.

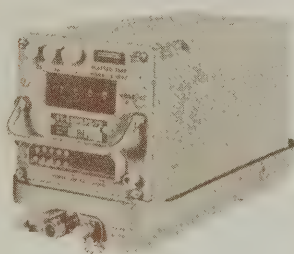


AN/UPA-38 VIDEO CODER GROUP

Manufactured by the Raytheon Co. for the U.S. Navy. An IFF Coding equipment designed for use with the AN/UPX-5 and 12 Radar Identification Sets. This group consists of a Video Coder and a Radar Set Control. This equipment is standard equipment on most U.S. Naval ships.

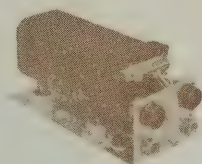
AN/APX-72 AIRBORNE & SHIPBOARD TRANSPONDER

One of the lightest, most modern and reliable IFF transponders, despite its small size. Has greater capability than previous transponders. It will store thousands of secure codes to identify military aircraft and is compatible with commercial systems for FAA air traffic control. These units are also being installed aboard all classes of U.S. Naval Ships. Write for full specifications and quotations.



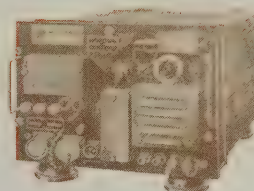
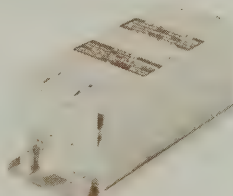
CPU-66/A ALTITUDE COMPUTER

Used in subsonic aircraft, it provides highly accurate altitude information for display to the pilot, as well as for automatic transmission to ground facilities via its associated transponder, the AN/APX-72, or similar.



TS-1843/APX IN-FLIGHT TRANSPONDER TEST SET

Installed between the antenna and the transponder, where it continuously monitors the performance of the transponder. Detects malfunctions and indicates to the pilot the condition of the system. This unit is used with the AN/APX-72 and other transponder sets.



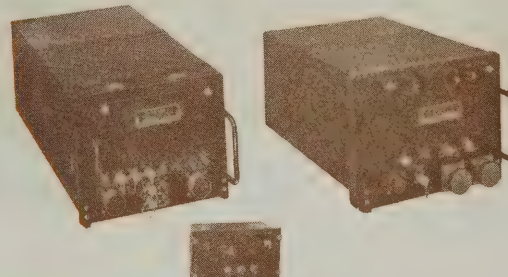
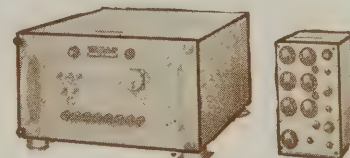
AN/UPX-6 RADAR RECOGNITION SET

One of the most widely used military radar recognition sets. This set is used at most U.S. Air Force and Army Ground Radar Sites as the IFF radar receiver-transmitter. This set can be used with a wide variety of coder-decoders including the very latest models. This equipment operates in the frequency range of 990 - 1130 mc.

AN/UPA-24, -24B DECODER GROUP

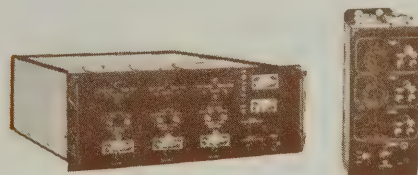
Facilitates the interpretation of coded IFF signals received from a radar recognition set. It selects a coded video pulse-train from the recognition set and presents the coded signal to a decode network.

If the pulse-train is coded correctly, an indication in the form of a single decode pulse is displayed on the radar indicator. If the pulse-train is coded incorrectly, a decode pulse is unavailable for presentation. Also available: AN/UPA-24A.



AN/APX-7 IFF INTERROGATOR

An Airborne Interrogator that operates in conjunction with a search radar. Provides a peak power in excess of 2 kw at L-Band frequencies for aircraft altitudes to 35,000 feet. This set is used for IFF and SIF operations.



OA-1133/GPX-8A DECODER GROUP

The OA-1133/GPX-8A Decoded Group has manufactured for the U.S. Air Force. This decoder group adds Mark X SIF decoding facilities to radar identification set AN/GPX-8 and radar set AN/CPN-4. Write for further details on OA-1133/GPX-8A Decoder Groups.

IFF TRANSPONDER SYSTEMS

Columbia can supply complete systems, major components and spare parts for the following systems - plus many others. Send us your inquiries. AN/APX-6, -2, -25, -26, -35, -44, -45, -46, -48, -64, -65, -72. • AN/UPX-1, -1A, -4, -5, -6, -8, -9, -11, -12, -14, -21, • AN/TPX-17, -18, -19, -20, -21, -25, -26, -27, -28, -29. • AN/GPX-6A, -7A, -8A, -9A, -17A, -18, -18A, -20, -27, -29. • AN/UPA-24, -38, -39, -39A. AN/UPM-4A, -6A, -6B, -8, -8B, -8C, -70, -70A, -98, -99, -110, -115. AN/GPM-40A, -44. • RT-211/TPX. • RT-264/UPX-6.

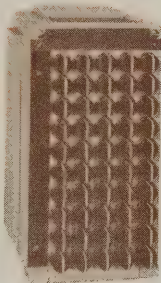


SHIPBOARD RADIO ACCESSORIES

Columbia can supply all commonly used U.S. Navy shipboard radio room ancillary items such as: Audio Frequency Amplifiers and announcing equipment, Audio Frequency Switchboards and Transfer Panels, Radio Frequency Switchboards & Transfer Panels, Loudspeakers and Intercommunications Equipment, Sound Powered & Standard Shipboard Telephone Equipment, Teletype-writer Power Supplies, Antenna Couplers, Microphones, Handsets, Chest Sets and Headsets, Antennas and Antenna Insulators. The items described in this section represent only a small fraction of the items we have on hand for prompt delivery. Contact us for all of your shipboard electronic requirements.

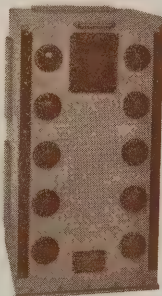
SB-82/SRR RECEIVER TRANSFER SWITCHBOARD

Contains ten, five-switch units, cross-matt parallel-wired, to transfer the output of one to five receivers, or other signal sources, to one to ten remote control stations.



SB-863/SRT TRANSMITTER TRANSFER SWITCHBOARD

Provides facilities for switching standard 12-wire transmitter control circuits so that remote control stations can be selectively transferred to a chosen transmitter. The switchboard provides the transfer of any one, or all, of ten remote control stations to any one of nineteen transmitters. Provision is made to extend the above capability of more than ten remote control stations, or more than nineteen transmitters, with additional switchboard of this type.



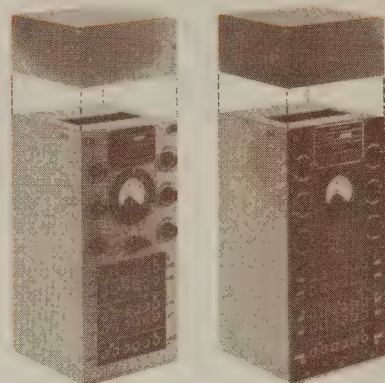
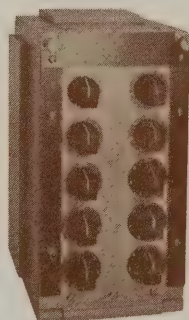
SB-988/SRT TRANSMITTER TRANSFER SWITCHBOARD

Transfers up to 10 remote control stations to a choice of up to 6 transmitters. The circuit arrangements make it impossible to parallel transmitter control circuits. Provision is made to extend the capability of more than ten remote control stations, or more than six transmitters, with additional switchboards.



SB-973/SRR RECEIVER TRANSFER SWITCHBOARD

Designed to transfer audio output of radio receivers to remote control station audio circuits. This unit provides for the transfer of any one, or all, of ten remote stations to the output of any one of five receivers. Provision is made to extend the capability to more than ten remote control stations, or more than five receivers, with additional switchboards of this type.



SB-1203A/UG & SB-1210A/UGQ COMMUNICATIONS PATCHING PANELS

Designed for shipboard use to facilitate interconnection and transfer of teletypewriters and various types of terminal equipment. Both models are similar except as follows:

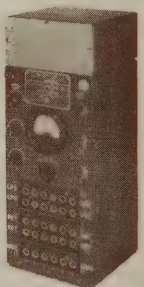
The SB-1210A/UGQ is a modification of the SB-1203A/UG and has been designed for patching requirements of secure teletypewriter channels. It has a red finish.

The patching panels each provide six channels, each comprising a circuit of two looping jacks, at least one set jack, and a rheostat for adjusting line current on each circuit.

The panels are designed for mounting side-by-side when more than six channels are required.

SB-2244/UG COMMUNICATIONS PATCHING PANEL

Intended for shipboard or land-based use to facilitate interconnection and transfer of teletypewriter and cryptographic equipment. The patching panel provides three signal and stepping circuits to a teletype transmitter-distributor from a cryptographic transmitter. Supplied with three special polarized patchcords.



AM-4453/U AUDIO FREQUENCY AMPLIFIER

A solid state 10 watt audio amplifier for general purpose use. Has provision for five audio inputs, 600 OHM balanced or unbalanced line. Provides internal loudspeaker, volume control, input selector switch, AC power input 115/1/50-60.



SHIPBOARD RADIO ACCESSORIES



C-1004B/SG TRANSMITTER TELETYPEWRITER CONTROL

A control unit for use with teletypewriter sending and receiving loop circuits. Its purpose is to switch a teletypewriter to either one of three DC loops.

LS-385/SIC & LS-386/SIC INTERCOMMUNICATION STATIONS

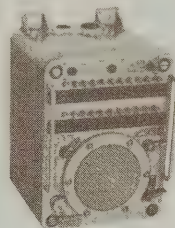
Designed for shipboard use, these stations provide two-way loudspeaking, hands-free communications between any two or more units in any combination of LS-385/SIC and LS-386/SIC stations, and, with one or more remote loudspeaker stations LS-305/WIC or LS-306/SIC.

The LS-385/SIC and LS-386/SIC units incorporate similar operating features. The LS-385/SIC will accommodate the selection of ten remote stations in a system. The LS-386/SIC has provisions for twenty remote stations in a system. These stations may also be used with intercommunications stations LS-518A/SIC, LS-519A/SIC, LS-458/SIC, and a variety of remote loudspeakers. As many simultaneous conversations can be conducted as there are pairs of stations.

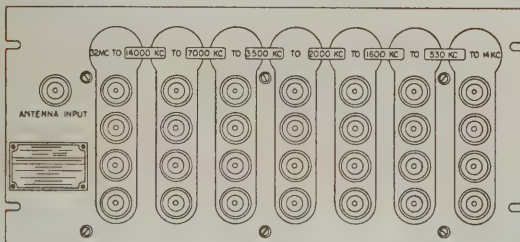
Specifications: AF Output Power: 10 watts • Power Input: 115/1/60 • Input Impedance: 16 ohms for loudspeaker, 150 ohms for microphone. • Output Impedance: 500 ohms (70 volts).



LS-385/SIC



LS-386/SIC



AN/SRA-12C ELECTRICAL FILTER ASSEMBLY

A receiving filter assembly that allows connecting up to seven receivers simultaneously into a single antenna. It separates the frequency spectrum between 14 KHz and 32 MHz into as many as seven RF bands. The separation is accomplished by combining various filter subassemblies. Any of six of the nine filter subassemblies may be used at one time. Connections to the receivers are made by means of coaxial patch cords.

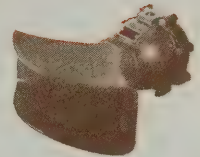
INVENTORY MAKES COLUMBIA TICK

In one location, under one roof, Columbia Electronics houses a huge, diversified inventory of electronics equipment. Some of our products first saw the light of day during World War II. Other items are so new, they won't be off the production lines until a month from now!

Before you assume an item is obsolete, off the market, or impossible to find — tell us about it. We may have it waiting for you on our shelf.

LS-558/U PERMANENT MAGNETIC EXPLOSION-PROOF LOUDSPEAKER

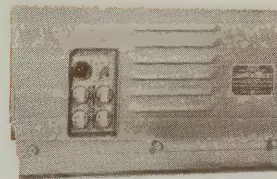
Designed for the Navy for use aboard ship in areas where atmosphere is subject to explosion. Loudspeaker is underwriters' Laboratories tested and approved. Equipped with a special 70-volt line matching transformer tapped from 1000 to 32,000 ohms. Sound pressures of 125 dB at 4 ft. are obtainable.



PP-3054A/UG TELETYPEWRITER POWER SUPPLY

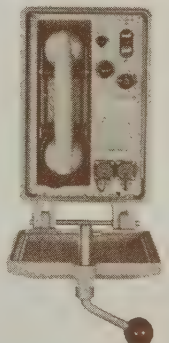
A magnetic amplifier regulated power supply for general purpose teletypewriter use.

Specifications: Input: 120/220V/1PH/50-60 HZ • Output: 125VDC @ 1 Amp regulation $\pm 5\%$, 0 to 1 Amp output • Dimensions: 17-3/8" W x 10-3/16" H x 10-3/4" D • Gross Weight 63 lbs.



C-1207/UR RADIO SET CONTROL

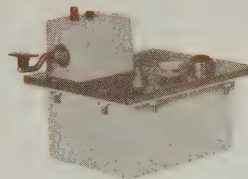
A remote control unit in a cast aluminum, watertight housing to provide necessary facilities to remotely control most standard shipboard radio transmitters, receivers and transceivers. Includes handset, power and carrier indicator lamps, volume control and remote power off-on switch.



SB-315B/U CONTROL PANEL AND TELEGRAPH KEY

Designed for general purpose use in shipboard radio rooms. It accomplishes the following:

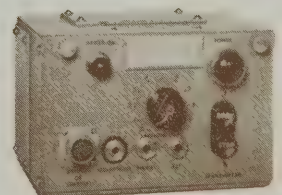
- Turns power on or off for an associated radio transmitter.
- Provides a light to indicate when the transmitter is on.
- Provides a fully adjustable telegraph key.



C-1138B/U RADIO SET REMOTE CONTROL

Provides necessary facilities to remotely control most standard naval shipboard radio transmitters and receivers. Provides the following features from a remote position:

- Turns equipment on or off.
- Carrier and power on indicator lamps.
- Audio volume control.
- Connections for handset, microphone, earphone and telegraph key.





RADAR SETS & ACCESSORIES

AN/TPS-33 PORTABLE SURVEILLANCE RADAR

A battlefield radar set designed to detect moving ground targets, at any azimuth, at ranges of 100 to 20,000 yards, and identify the nature of the target. Write for complete specifications on this very versatile radar set.



AN/KPQ-1 RADAR SET

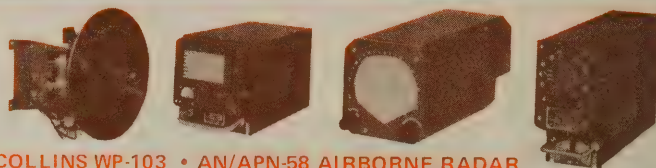
A modern portable radar set capable of acquiring and tracking 81 mm mortar shells within a maximum range of 8000 meters. Write for further details.

AIRBORNE RADAR SETS AVAILABLE FROM COLUMBIA

AN/APN-59 Navigation and Search Radar • AN/APN-89 Doppler Radar Set • AN/APN-22 Radar Altimeter Set • AN/APN-117 Radar Altimeter Set • AN/APN-133 Radar Altimeter Set • AN/APN-141 Radar Altimeter Set • AN/APN-147 Doppler Radar Set • AN/APN-150 Radar Altimeter Set • AN/APS-20 Search Radar Set • AN/APS-31 Search Radar Set • AN/APS-33 Search Radar Set • AN/APS-38 Search Radar Set • AN/APS-42 Search Radar Set

SHIPBOARD RADAR EQUIPMENT

AN/SPA-4A Radar Range-Azimuth Indicator • AN/SPA-8, 8A Radar Indicator Group • AN/SPA-18 Radar Indicator Group • AN/SPA-25 Radar Indicator Group • AN/SPA-33 Radar Indicator Group • AN/SPS-4 Search Radar Set • AN/SPS-5D Search Radar Set • AN/SPS-6 Search Radar Set • AN/SPS-10 Search Radar Set • AN/SPS-36 Search Radar Set • AN/SPS-53 Search Radar Set
Columbia can supply the above plus many more shipboard radar sets and associated equipment. Please write for items in which you are interested.



COLLINS WP-103 • AN/APN-58 AIRBORNE RADAR

A very modern airborne weather radar used aboard many types of military and civilian aircraft.

Specifications: Frequency Band: X-band • Peak Power Output: 15 kw minimum • Antenna Azimuth Scan: $\pm 60^\circ$ sector scan • Range mark Intervals: 10, 15 and 25 nautical miles.

AN/SPA-4A RADAR RANGE - AZIMUTH INDICATOR

Provides PPI type presentation of target range and azimuth when supplied with video and trigger signals from any one of eight naval search radars. The AN/SPA-4A is standard equipment on all classes of naval vessels.



AN/APN-147(V) DOPPLER RADAR SET

An airborne radar set built by Canadian Marconi for the U.S.A.F. It is standard aboard the Lockheed C-130 Hercules Aircraft. All major components are in stock.

AN/SPA-8 RADAR INDICATOR GROUP

A general purpose PPI used in all types of Naval Ships. It can be used as a Master or Remote Radar PPI Repeater, as Radar Relay Search Tracking Indicator and as a Radar Relay Search-Repeat Indicator. The AN/SPA-8 has a 10" PPI with electronic cursor.



GROUND RADAR EQUIPMENT

AN/GPX-17 IFF Interrogator Set • AN/GPX-20B IFF Interrogator Set • AN/MPQ-4A Mortar Locating Radar Set • AN/MPQ-10 Mortar Locating Radar Set • AN/TPS-1D Search Radar Set • AN/TPS-10D Height Finding Radar Set • AN/UPA-35 PPI Indicator Group • SCR-584 Radar Set • These are only a portion of the radar equipment that Columbia can supply. Write for more information specifying units in which you are interested.



MISCELLANEOUS EQUIPMENT

DISTRESS MARKER LIGHT

The Strobe Distress Marker Light was designed to assist in the rescue and recovery of personnel, passengers or materiel that may have been washed overboard from a vessel. It is required and mandatory equipment on all Merchant Marine Vessels and carries U.S. Coast Guard Approval for Electric Water Lights, No. 161.010/2/1.

When not in use, the Strobe Distress Marker Light is mounted on a non-corrosive bracket in an upside down position on the bulkhead. When needed, it may be pulled from the bracket and dropped hundreds of feet into the water, where it will come up in an upright position, flashing and floating. It will flash for 15 hours on one No. 6 dry cell battery. Can be seen for many miles.

Provides 400,000 peak intensity candlepower and can be seen from all directions for great distances. Currently being supplied by Neo-Flasher Electronics, Inc. to U.S. Navy. The case is of permanently orange colored, non-breakable plastic and the lens is clear, non-breakable plastic. Meets all watertight, shock, weather and light output tests. Contact Columbia for all Neo-Flasher products.



AN/GRN-9 GROUND TACAN BEACON

The AN/GRN-9 is comprised of Receiver-Transmitter Group OA-3352/GRN-9D and Power Supply Group OA-1537/GRN-9A. These components form a complete transmitting and receiving facility used as a ground beacon in the TACAN Air Navigation System. This system functions throughout the world as a means of supplying accurate distance and bearing information to TACAN equipped aircraft. The AN/GRN-9 is functionally compatible with all of the "ARN" family of airborne TACAN sets, such as the AN/ARN-21 and AN/ARN-52, to provide navigation information over a 200 mile radius.

This Set makes available 125 frequency channels, with each channel capable of providing range and bearing information to 100 aircraft, and bearing only information to an unlimited number of aircraft. Columbia can supply a wide range of ground and shipboard TACAN equipment and accessories. Tell us your needs.





MISCELLANEOUS EQUIPMENT

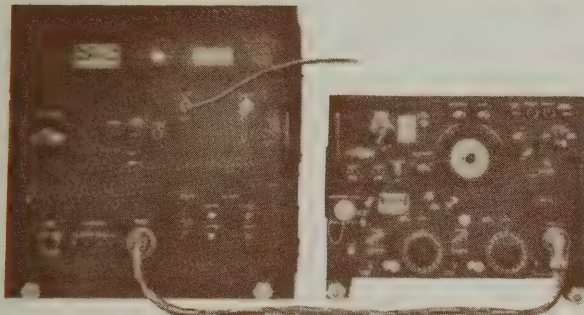
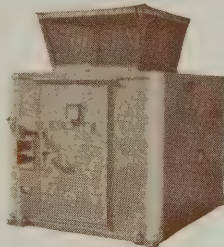


AUTOPILOT SYSTEM TRAINER

A self contained training device incorporating a complete Sperry MA-2 and A/A 42G-11 Autopilot System as found aboard the B-52 Aircraft. Ideal for training pilot and maintenance as all functions of the system perform and control a miniature aircraft. This training device was built by the Boeing Company for the U.S. Air Force Training Command. Power Requirements 28 VDC and 115V/1/400.

PORTABLE AIRPORT CONTROL TOWER

A very compact transportable shelter available with a wide option of radio communications equipment. This shelter can also be supplied with a trailer for complete mobility. Write for quotation with your choice of radio equipment installed.



AN/APN-84 SHORAN NAVIGATION RADIO SET

Manufactured by RCA for the U.S. Air Force, was designed to be installed in aircraft. It indicates its distance from two Shoran Ground Stations. This set replaces the AN/APN-3. The AN/APN-84 can also be used as a ground station. Major Components: T-342/APN-84 Radio Transmitter • IP-186/APN-84 Receiver Range • Also available: AN/APN-84 Spare Parts. • AN/USM-58 Shoran Radio Test Set.

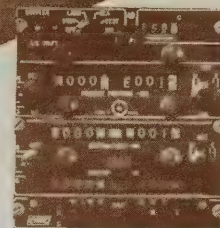
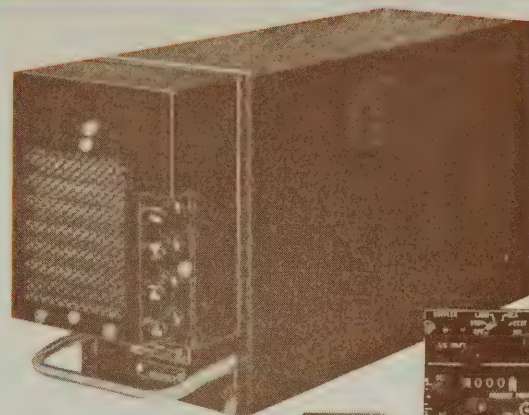
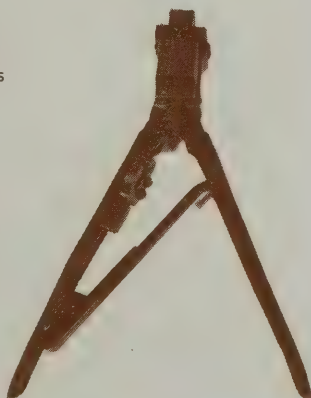
CU-691/U • CU-692/U UHF ANTENNA COUPLERS

The CU-691/U UHF Antenna Coupler provides isolation between four UHF Transmitters or Receiver combinations operating simultaneously from a common antenna. Specifications: Frequency Range: 225 - 400 mc • Maximum power handling capability: 200 watts continuous • Maximum SWR: 2:1 • CU-691/U Antenna Coupler CU-692/U Dual transmitter antenna coupler.



MK-356/G TELEPHONE WIRE SPLICING KIT

The Wire Splicing Kit MK-356 consists of a canvas carrying case, four magazines for splicing cartridges, and a crimping tool TL-582. One handle of the Tool TL-582 has a wire cutter and stripper. The stripped ends of the conductors to be spliced are inserted into the opposite ends of a splicing cartridge that has been fed into the jaws of the tool. The handles of the tool, which operate on a ratchet principle, are then squeezed together crimping the cartridge. Each cartridge is made of 3 sleeves; one tin, one copper, and one plastic. The finished splice is abrasive resistant, waterproof and forms a good electrical connection.



AN/AYA-3 AIRBORNE NAVIGATION COMPUTER

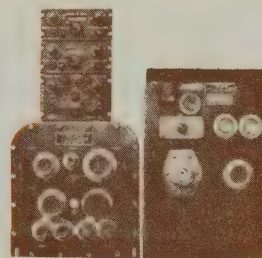
The AN/AYA-3 Navigation Computer, manufactured by Canadian Marconi Company, is a light-weight fully transistorized airborne unit for use in both fixed and rotary wing aircraft. The Computer uses operational digital techniques to make, through the process of dead-reckoning, four distinct major computations: • Continuous calculation of present position relative to a point of origin. • Continuous calculation of distance and bearing to a selected destination. • Continuous calculation of windspeed and direction; or, during Doppler Memory and Air Data modes, uses last known or manually updated windspeed and direction to calculate groundspeed and drift angle. • Optional calculation of the ratio of groundspeed to absolute altitude. The AN/AYA-3 accepts track angle and groundspeed information from AN/APN-168 or similar Doppler Sensor. Accessories include a Vh — Vd to Groundspeed and Drift Angle Converter, CMC 404-306, which allows compatibility with Doppler systems which do not provide digital groundspeed outputs. Write for Complete Data.

AN/UQC-1E SONAR SET • UNDERWATER TELEPHONE

AN SSB suppressed carrier transceiver designed to provide voice communications between naval vessels at ranges up to 12,000 yards. This equipment is mainly used for communication between surface ships and submarines.

AN/ALT-8B COUNTER-MEASURES TRANSMITTING SET

Manufactured by the Raytheon Company can be used to jam radio and radar signals in the frequency range of 950-1525 Mc and 2350 to 3600 Mc. This set has four different types of jamming emissions: Spot Jamming, Automatic Slow Sweep, Automatic Fast Sweep, and Automatic Slow and Fast Sweep. This set can be



supplied with either one or two transmitters each for a different band, powered from a common power supply. The transmitters have a RF output power of 150 watts minimum.

COLUMBIA CAN SUPPLY MIL SPEC ELECTRONIC COMPONENTS

We can supply for prompt delivery in quantity, at competitive prices, the following components. All brand new: Electrical Connectors: All AN and MS Series. All UG Series, All PTO Series, All U, UW, MW Series All PL, PJ and JJ Series plus many others, as produced by Amphenol, Bendix, Burndy, Cannon, etc.

Military Synchros: All types and sizes military and commercial spec quartz crystals. • Mil-Spec Resistors: All types and values. • Mil-Spec Condensers: All types and values. • Mil-Spec Relays: All types and sizes. • Mil-Spec Switches: All types and models. • MIL Spec Fuses and Circuit Breakers: All types and models. • Mil-Spec Wire and Cables: All types and sizes • Electron Tubes: All Types. • Semi Conductors: All types. • Waveguides and Fittings: All types and sizes • Mil-Spec Panel Meters: All types and sizes. • All major brands are stocked. Write for prompt competitive quotations.

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DOMESTIC TERMS

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All prices quoted are net, F.O.B., our warehouse in North Hollywood, California.

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Name of Item	Model Number	Quantity Desired	Specifications and/or Manufacturer	Shown On Cat. Pg. No. (If listed).

Push Reply to: (Please type or print clearly).

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DOMESTIC TERMS

We require remittance with order from firms located in USA; or, we will ship open account, net 30, to firms favorably rated with Dun & Bradstreet.

All prices quoted are net, F.O.B., our warehouse in North Hollywood, California.

California Residents add 6% sales tax, if applicable, or tax in force at time of purchase.

All merchandise subject to prior sale.

EXPORT TERMS

All prices quoted are in U.S. dollars, F.O.B., North Hollywood, California, U.S.A.

Buyers outside of the United States will send remittance with order, or a confirmed, irrevocable letter of credit payable at a Los Angeles, California bank, preferably the Bank of America.

All merchandise subject to prior sale.

CERTIFICATION

U.S. Government source inspection and certification available.

All avionic equipment can be supplied with a certificate of airworthiness issued by an F.A.A. approved overhaul and repair station.

PACKING

Domestic or Export packing to best commercial practices so as to assure safe arrival.

Packing to U.S. military specifications also available if required.

CONDITION OF MERCHANDISE

Columbia Electronics sells equipment in a variety of conditions, to meet the widest range of buyer requirements:

1. All merchandise manufactured by companies we represent is newly manufactured from current production and meets all applicable specifications. The equipment is guaranteed by new factory warranties and backed by Columbia Electronics.
2. New, unused. (Never previously used)
3. Reconditioned-Renewed (previously used).
 - A. When we offer renewed material, we guarantee the reconditioning to be as new in accordance with applicable factory or military specifications.
 - B. We certify this material to look and perform in the same working condition as when new, and we warrant it to fulfill the same specifications established by the original manufacturer for new, similar equipment.

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